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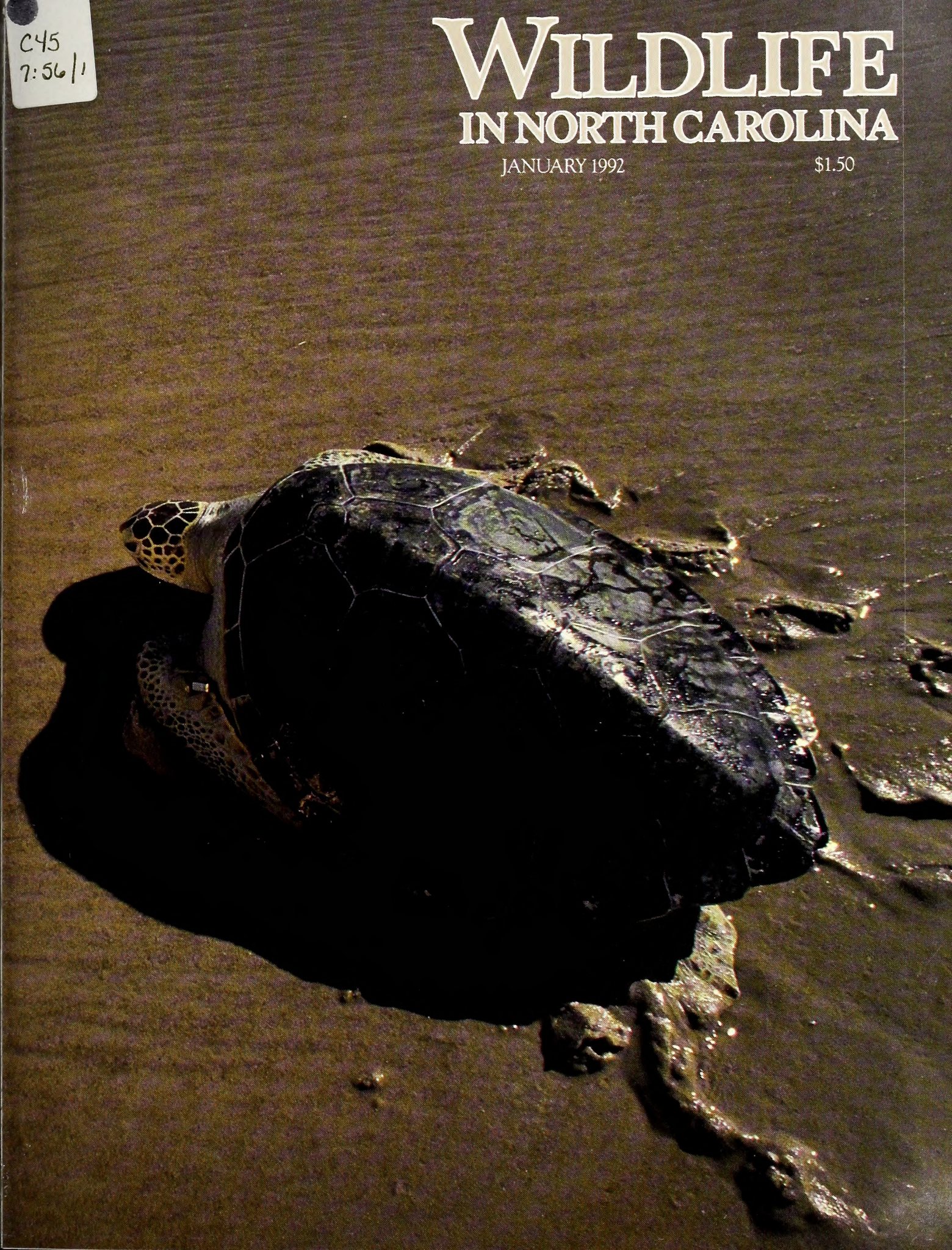
# WILDLIFE IN NORTH CAROLINA

JANUARY 1992 $1.50



# Occoneechee's River Treasure

*by Jim Dean*

If I travel the thread of memory back to the early 1950s, I come to the dark isolation of Occoneechee Neck, to rumors of buried Confederate silver and to the sleepy warmth of a backseat as we skirt the dark woods and swamps on U.S. 158 in Northampton County. It is a late afternoon in winter, and my nose is pressed against the cold glass as we pass through Jackson where strings of colored lights sag across the road.

Just west of town, we pass a tall abandoned house, its black windows overlooking huge cotton fields that stretch to the far woods. A few tiny blue lights mark a distant tenant house. At the head of the long curve just before we reach the millpond with its black water and shaggy cypress, we pass a road that slants to the left.

"Goes down into the Neck," says Dad.

I know about the Neck, or think I do. It is a brooding place of murk and monster, populated by the ghosts of Confederate officers and a young black boy who stumbles onto a long-lost treasure. It is more than enough to tantalize me, though I have seen only this watery finger at Boone's Mill where we cross Gumberry Swamp. Much of what I believe about the Neck—as I learn much later—is imagination. Mine and, more especially, Mebane Holoman Burgwyn's.

JIM DEAN

A few miles south of Weldon, the Roanoke River makes a sweeping curve that describes and isolates Occoneechee Neck. Bland Simpson writes in this issue of this place's unique blend of history, its diverse wildlife, its priceless wetlands, unusual riverine typography and of its people, some of whom have owned and farmed land here for 200 years. But he does not wholly bury my ghosts, nor try to.

So, on a cool, overcast day this past November, Merrill Lynch and my son, Scott, and I turn south off 158 onto State Road 1128—one of two roads into the Neck—and begin to explore. Merrill is an avid birder who works for The Nature Conservancy. Like me, he grew up in Roanoke Rapids, but he knows this region far better than I do. Throughout high school, he regularly visited the Neck, and each December he returns to take part in the Audubon Society's Christmas bird count.

On land still owned by the heirs of Henry K. Burgwyn—the boy colonel of the Confederacy who was killed at Gettysburg—we walk the ridges and swales formed by the meandering river. We shoot photographs of beaverponds in the old oxbows and massive cotton fields on the higher ground. Some of the fields are so big and flat that they attract horned larks from the prairies and tundra. We stop at the abandoned store at Mud Castle, and cross Occoneechee Creek, considered the true northern boundary of the Neck. On the fringes off 158, we take pictures of the deteriorating home of Confederate General Matt Ransom. A few miles to the west, the lane into Longview Plantation is bordered by 200-year-old pines.

Like Faulkner's Mississippi, history and wildness lie close here. Yet, it is clear that the Neck is not quite the forboding place I'd imagined as a child. Except for the silver. Did it exist beyond the tattered pages of Mebane Burgwyn's *River Treasure*, the children's book I'd read and reread so many years earlier? Was it still deep in some oxbow flooded years ago by the Roanoke? Only she might know.

Her first reaction was to laugh gracefully when told her book was remembered so fondly. Then, she told this story: "My husband, John, and I first moved to the Neck about 1936," she said. "I was interested in writing at the time, and eventually wrote seven books. Three of those books, *River Treasure* (1947), *Lucky Mischief* (1949) and *Hunter's Hideout* (1959) were written about this area.

"Shortly after we arrived, John showed me a letter from an old man living in Maryland. It had been written to John's uncle, Henry Burgwyn. Among other things, the writer hinted that he knew the whereabouts of a chest of silver that had been buried by the Burgwyn family during the Civil War before Federal troops were turned back at a skirmish at Boone's Mill. We'd heard rumors of such a chest before, but no one had ever been able to confirm them.

"I showed the letter to some older folks living around Bull Hill on the western edge of the Neck where the Burgwyn homeplace had stood, and they told me that the old man in Maryland was in a mental institution—that I shouldn't pay any attention to him. In a second letter, the old man seemed more vague about locating the treasure, saying he'd need a 'divining rod' to find it. We didn't pursue it further, but I still have those letters somewhere.

"To this day, we don't know if the chest of silver ever existed, or if it did, whether it was found," she said. "But it was enough to give me an idea for a book, and that's how I came to write about a poor, young black boy who found buried silver here."

Surely, there will be times when I again drive past Boone's Mill or down to Mud Castle, most likely during holidays as before, and I'm sure I will still look off into those dense cypress and wonder. Could it be that Mebane's young hero may yet step through the top of a rotting chest?

*January, 1992*
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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Cover** *Less common than the loggerhead sea turtle, an Atlantic green sea turtle crawls back to the surf after laying her eggs. Photograph by Lynda Richardson.*

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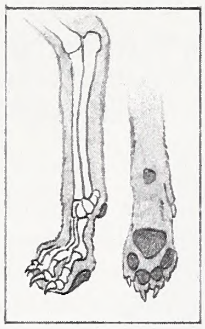
**Excellent hearing.** *Canids have large, pointed and erect ears.*

**Long snouts.** *Canids' acute sense of smell aids hunting and also communication. Wolves can smell prey a mile away. They mark their territory with urine and use scent to identify each other.*



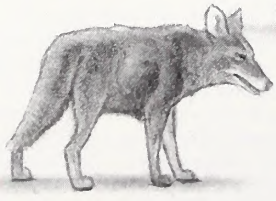
**Digitigrade limbs,** *meaning that canids run on their toes. Canids have five toes on their front feet, four on the hind feet and a dew claw above the paw.*

**A red wolf,** *newly released in the Smokies, runs down a wild piglet. Its taste for ham may be an acquired one, since wild boars are not native to this country, but like all canids the wolf is a predator and takes what it can get. Some of the canids' physical adaptations are detailed above.*

## North Carolina's Canids

**Red wolf** (*Canis rufus*). *Smaller than the gray wolf, the red wolf ranges from 4½ to 5½ feet in length and weighs no more than 40 pounds. These wolves have 3 to 5 pups per litter.*

**Gray wolf** (*Canis lupus*). *The largest of our canids, gray wolves can grow from 4½ to 6 feet long and weigh as much as 176 pounds. Like all wild canids, they have one litter per year, bearing an average of 6 pups per litter.*



**Coyote** (*Canis latrans*). *Similar in size to the red wolf, the coyote averages 3 to 4 feet in length and weighs 20 to 40 pounds. It has 5 to 6 pups per litter.*

**Red fox** (*Vulpes vulpes*). *Grows from 39 to 41 inches long and weighs from 4 to 12 pounds. The red fox bears 4 to 5 pups in each litter.*

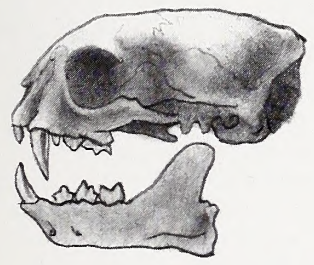
**Gray fox** (*Urocyon cinereoargenteus*). *The smallest of our canids can grow to 40 inches in length, weighs 7 to 10 pounds and bears 2 to 7 pups.*

D. Williams

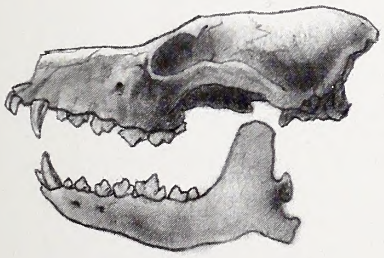
***Long, bushy tails.*** *The way canids carry their tails communicates information to other members of their species.*

***Long, thin and strong legs*** *help the canid run fast. A gray wolf can run for 20 miles before needing to rest.*

***Thick fur.*** *Gray wolves have distinct layers of fur that shed water and help keep them warm in colder regions.*



*cat family*



***Cat and dog skulls*** *show similarities and differences. The massive lower jaws and long pointed teeth (canines) of both families identify them as carnivores. But canids have an elongated jaw, unlike cats which have more rounded muzzles.*

# Meet the Canids

*written by Lawrence S. Earley/illustrated by David Williams*

Imagine the scene—deep in the Alligator River National Wildlife Refuge, two animals peering at each other across the wintry landscape. One, the shy and reclusive red wolf, has been recently returned to these parts in the hopes that its faltering populations will recover. The other, the more common gray fox, has been a state resident for years.

Staring briefly before trotting away, the two animals may recognize a complicated heritage that binds them. Being carnivores, they're both meat eaters. But being members of the canid family, they're both feared and distrusted by humans.

Canids arose in North America millions of years ago, crossing the ancient land bridge over the Bering Straits. Today the canid or dog family (*Canidae*) embraces wolves and foxes as well as coyotes, jackals, dingos and smaller doglike species found on almost every continent on earth.

Here's a rundown of North Carolina's canids:

- Red wolf. Occupying upland and bottomland forests, coastal prairies, swamps and marshes, it lives in small groups, but sometimes it has been known to form packs. Mates for life. Eats small animals such as rabbits, squirrels and mice, but will also take deer.
- Coyote. Prefers open habitats. In the western states, it congregates in family groups. Preys on rabbits, rodents and even deer, but also scavenges.
- Red fox. Prefers open fields to woodlands. Mates for life. Hunts singly, although some red foxes are known to hunt in groups. Preys primarily on mice and rabbits.
- Gray fox. Leans more toward forested areas than open areas. Mates for life. Hunts similarly to the red fox. Preys on rodents and rabbits, but also eats berries and other fruits in season.
- Gray wolf (extirpated). The larger gray wolf (also known as the timber wolf) lived here until it was exterminated about a century ago. Larger than all other canids, the gray wolf is adapted to forests as well as plains. Hunts in packs. Mates for life. Takes large game (deer, elk, moose) and smaller prey such as rodents.

(Descended from the gray wolf, the domestic dog is sometimes considered a domesticated form of the wolf, not a separate species.)

As carnivores, these species have much in common with weasels, bears, raccoons, cats and other predators. They are adapted to hunt, with speed, stamina and strength, and with teeth adapted for biting and tearing flesh. A gray wolf may eat 20 pounds of caribou at a sitting, feasting when it can in anticipation of poor hunting success later. Unlike plant-eating herbivores, canids and other carnivores have a relatively simple stomach, enabling them to digest large amounts of food quickly. Probably the most remarkable aspect of many canids' life history is their social organization. Most canids mate for life, and many of them hunt in pairs or in family groups. The highest development of this social sense is the hunting pack of gray wolves, jackals and other canids. The highest ranking male and female are often the only members of the pack that mate. The other members help rear the young.

Humans have often had an irrational fear of wolves and even of foxes, hunting many species to the brink of extinction. But given a chance, the ancient line of canids can adapt to the diminishing spaces we grant them on the outskirts of our lives.

# Fast Food

If you were nearly every predator's favorite meal, wouldn't you handle your affairs at double time?

by Joel Vance ©1991

Given a cottontail rabbit's ecological function, it should have "Born To Die" tattooed somewhere on its succulent body.

Rabbits are snack food for every predator and, right at the top of the predatory heap, is the fellow with the battered shotgun and the yelping beagle.

It depends on where in North Carolina you hunt, but in many areas rabbits aren't as easy to come by as they once were—a situation true almost everywhere. Theories abound. "We're losing some areas to urbanization, but for the foreseeable future, we're still going to have good spots for rabbit hunting," says Terry Sharpe, small-game project leader for the N.C. Wildlife Resources Commission. "The northern Piedmont is urbanizing—springing up with houses. And most of those houses have cats and dogs. They aren't family farms anymore. The people who used to live in the area kept chickens, so they controlled predators. But now those who live there are adding predators, especially feral and free-ranging cats and dogs."

Predators are man's competition, and the classic wry definition of a predator is "an animal that beats us to something we want for ourselves."

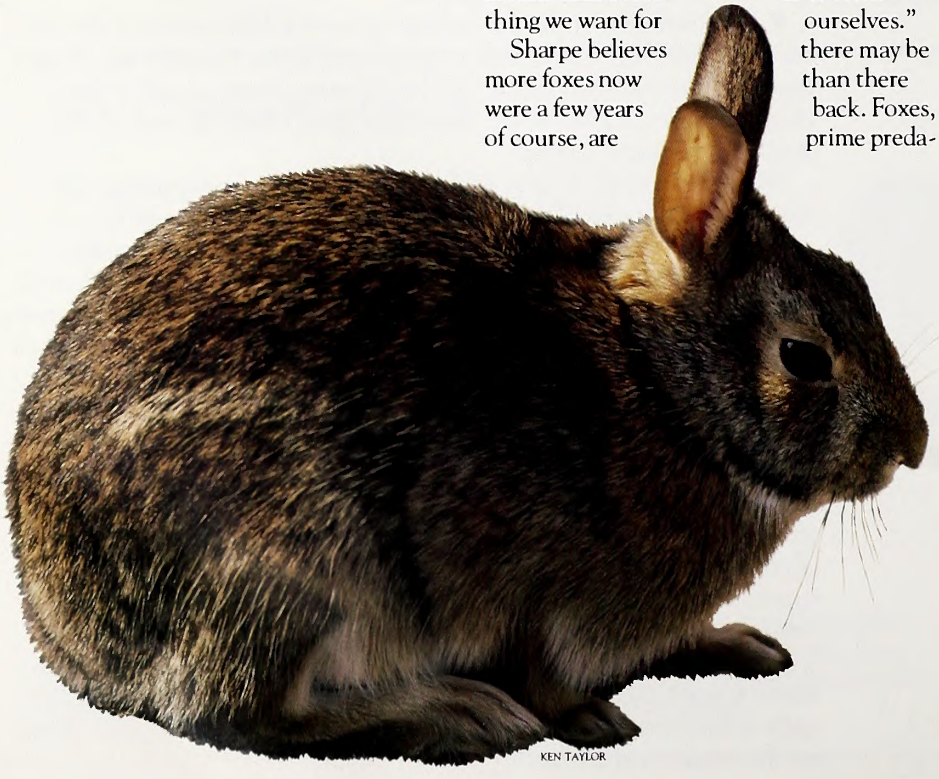
Sharpe believes there may be more foxes now than there were a few years back. Foxes, of course, are prime predators on rabbits. Coyotes are a new threat, just beginning to arrive. However, predation from wild animals is self-limiting to an extent. Without food, predators decline and then the food (rabbits) increases. But people still have their dogs and cats. Unlike wild predators, they do not decline when prey species diminish.

But predation is only one factor in the general rabbit decline. The biggest problem is the deterioration of habitat. Where once there were small farms with brushy fields and much "edge," now there are huge fields with no cover. Larger corporate farms in the Coastal Plain are prime examples. The old joke is that in such areas if a rabbit wants something to eat, he'd better carry a lunch bucket.

"Good remaining rabbit habitat now is in islands, surrounded by poor habitat," says Sharpe, "and the predators key on the small areas of good habitat where there are easy pickings."

Since 1982, the Wildlife Commission has been studying rabbits at the Penny Bend Rabbit Research Area in northern Durham County. Each November, personnel set out 100 box traps to monitor rabbit populations and find out how they are faring. The Commission started a mammalian predator control program on the area in 1990. It will take a few more years of collecting data to decide if reducing predators will increase rabbits. One year is only an indication; several years show a trend.

Fortunately, where you've still got good habitat, there are rabbits for the taking. Eddie Lucas is an avid rabbit hunter who lives in Wilson and runs a dozen beagles—all at once. "They make some music," he says. He rabbit hunts the thick brushy flatlands near Raleigh a couple of days a week during the season, and he doesn't think there are fewer rabbits than there used to be.



KEN TAYLOR

***Although rabbit hunting** isn't what it used to be, there are still plenty of cottontails for hunters who locate quality habitat. The prolific breeding capabilities of rabbits make them a classic prey species, providing food to a wide variety of predators—including the hunter.*

EUGENE HESTER

***Excited beagles** are eager to jump the trail when released. Quality dog work is a large part of the rabbit hunting experience, and beagles are a favored breed.*

But he works hard at his hunting, busting brush and spending the time that other hunters don't. Much of the brush is honeysuckle and briers, a tangle that not only is tough to fight through, but hurts you, too.

"A lot of guys say the rabbits just run around in there and you can't get them out. I hear that all the time," Lucas says.

"I hunted a place last year and the fellow said he had a lot of rabbits behind his house, but you couldn't get them out. Well, several of us killed 15 in there in about 45 minutes."

For that kind of hunting, it helps to have young legs. Lucas' son, Mike, and son-in-law, Rusty Cline, help him bust the brush. "They get right in there and move 'em around," he says.

Lucas thinks habitat has changed but not to the detriment of rabbits. "You don't find them out in pastures the way you used to," he says. "They're back in the brush. I don't know—maybe it's predators."

Once the pack jumps a rabbit, Lucas finds a good spot, knowing that the bunny will make a circle, and enjoys the hound music. It's what he likes about rabbit hunting. "You're into the hunt more and you hear the dogs more than with other hound hunting," he says. "You can hear a 15- or 20-minute race without any breaks. You also don't have to worry about them going 10 miles down the road and then having to find them."

Rabbit hunting with hounds is more than simply letting the dogs loose and hoping for the best. Experienced hunters tailor their tactics to the situation at hand. "If I'm going to hunt and it's been extremely cold, I hunt the side of the woods where the sun comes up," says Lucas. "The rabbits sit on the sunny side of the woods. We try to find the thickets and where they're going to find food. This dictates where rabbits are going to be."

For Lucas, an ideal rabbit-hunting day would have high humidity and be from 40 F to 50 F. He takes his time getting into the field. He has breakfast about 7 a.m., loads up and turns the dogs out about 8:30 a.m. He uses a 16-gauge, double-barrel shotgun, and all in the party wear hunter orange for safety. They don't shoot rabbits on the jump but wait for the bunny to come 'round, well ahead of the beagles.

By using beagles and a shotgun, Lucas is typical of most North Carolina rabbit hunters. Other hunters, though, opt to stalk bunnies and shoot them with arrows, rifles or pistols. Bow hunting with arrows that have "flu-flu" wire tips and fletching is extremely sporty. Practice by kicking cheap rubber or plastic balls and shooting at them. You'll bust a few balls, but you'll be amazed at how accurately and instinctively you'll shoot. Of course, you can also shoot with regular blunt tips and regular fletched arrows, but you'll miss more shots and lose many arrows as they slither in the grass.

Some hunters opt for .22 caliber rifles and take only sitting bunnies, while others use target pistols, often with scopes. It takes a good shot, especially with a pistol, to lead and hit a running rabbit. It also can be a dangerous way to hunt unless hunters are very careful. (Pistols are legal for rabbit hunting in North Carolina as long as their barrels are 6 inches long or longer and fire a .22 Long rifle cartridge or larger.)

Few hunting situations are as potentially dangerous as shooting at a running rabbit. Flushed birds usually are above head level and mostly in front of the hunters. But bunnies, darting on the ground, demand caution. You can shoot the dog or a hunting partner in the heat of the moment, and no rabbit is worth that.

As now required by law, all hunters must wear a blaze-orange garment visible from all sides, and everyone should be aware of other hunter's locations at all times. If there's *any* doubt, don't shoot!

A good beagle is one aid a serious rabbit hunter shouldn't be without. It has something you don't—a good nose—and can sniff out rabbits that otherwise would sit tight and let you walk past. A started bunny will circle ahead of beagles, so the patient hunter finds a vantage point (a big stump is good) and waits for the rabbit's reappearance.

Rabbits are programmed by nature to be food. Annual mortality is huge, but so is their reproductive capacity. A female rabbit can have four or five young in her first litter of the year in March and have three or four more litters before the end of the year. Her first-born in turn can bear young before the year's end. So, a local decline in rabbits can quickly be overcome if conditions change—an improvement in habitat, for instance.

Rabbits and quail have virtually identical habitat needs and, often, the same food requirements, too. Where you find one species, you'll generally find the other. Most hunters have had the experience of jumping a rabbit that flushed a covey of quail, creating a fluster that usually results in much noise and misdirected shot and a good many novel excuses for missing.

Both species thrive in weedy, brushy areas near seed-bearing crops. Overgrown ravines or dense thickets are ideal. Fence rows are obvious places to hunt rabbits, but remember that fence rows also are travel lanes for every

EUGENE HESTER

***To bring rabbits to the bag*** *these days, most hunters need to hunt thick brush and brier patches. The heavy cover offers cottontails a place to hide from predators, and a good team of dogs and a stout pair of legs are vital to hunting success.*

other sharp-toothed competitor. Foxes and coyotes quickly learn that fence rows offer easy hunting.

The best time to hunt rabbits is after a light snow, which is a rare occurrence in the best rabbit areas of the state. When it snows, however, you can spot dark rabbits against the white background, and they leave telltale tracks that can lead you to a hide. Keep in mind, though, that one rabbit can make an enormous number of tracks. You can be fooled into thinking there are more bunnies than there actually are.

In some areas of the country, the federal Conservation Reserve Program (CRP) has brought back small-game habitat, at least temporarily. Landowners bid acreage into the program, agreeing to retire it for 10 years from row cropping and plant a cover crop that can be excellent for rabbits and other small game. Some Midwestern states have nearly 2 million acres each enrolled in the program, but most of North Carolina's CRP land is being planted in pine trees. This is providing decent small-game habitat right now, but as the timber matures the quality of the habitat will decline.

Tularemia is common in rabbits, though fortunately not in North Carolina. But it is an unpleasant disease. The organism can enter the body through breaks in the skin or by a puncture from a splintered bone, so it's wise to wear rubber gloves when you're dressing rabbits. Tularemia bacteria are destroyed by cooking, but don't shoot rabbits that appear ill or listless. If the rabbit's liver has white spots on it, it may have tularemia.

Field dress a rabbit as soon as possible (don't let the dogs eat the intestines—they harbor parasites). To skin the rabbit, make a small cut in the back, get the first two fingers of each hand in the cut and pull in opposite directions. The skin should peel back over the head and tail. Work the skin over the legs, then chop off the head and feet. Most people divide a rabbit into six pieces: the four legs and the back cut in two pieces.

Rabbits are as pleasant to eat for humans as for foxes. Eddie Lucas often fries young rabbits but barbecues older ones. His mother makes a rabbit salad. "It's just like chicken salad, only using rabbit meat instead," he says.

In my opinion, the best wild-game cookbook around is *The Bounty of the Earth* by Sylvia Bashline (Winchester Press, 1979) for $18.95 postpaid from her at Rural Delivery, Spruce Creek, PA 16683. Sylvia has six pages of rabbit recipes, including hassenpfeffer, the quintessential rabbit recipe:

**Hassenpfeffer**

*2 rabbits*
*3 tablespoons butter*
*1 teaspoon salt*
*1 medium onion*
*4 cloves*
*12 black peppercorns*
*1 teaspoon thyme*
*1 bay leaf*
*1 cup lemon juice*
*1 cup port wine*
*2½ cups beef bouillon.*

Sprinkle rabbit pieces with salt and pepper and saute in the butter until brown on all sides. Place in a 3-quart casserole. Add salt, onion stuck with cloves and a cheese-cloth bag with the peppercorns, parsley, thyme and bay leaf tied inside. Also add the lemon juice, port and bouillon. Cover and bake for 1½ hours at 350 F. Ten minutes before the rabbit is done, remove the cheesecloth bag. The broth can be thickened to use as gravy. Will serve five. Serve with rice, spinach salad and currant jelly.

That should be incentive enough for anyone to whistle up Ol' Simonize (he wipes the field clean) and grab the 12-bore this rabbit season. ☒

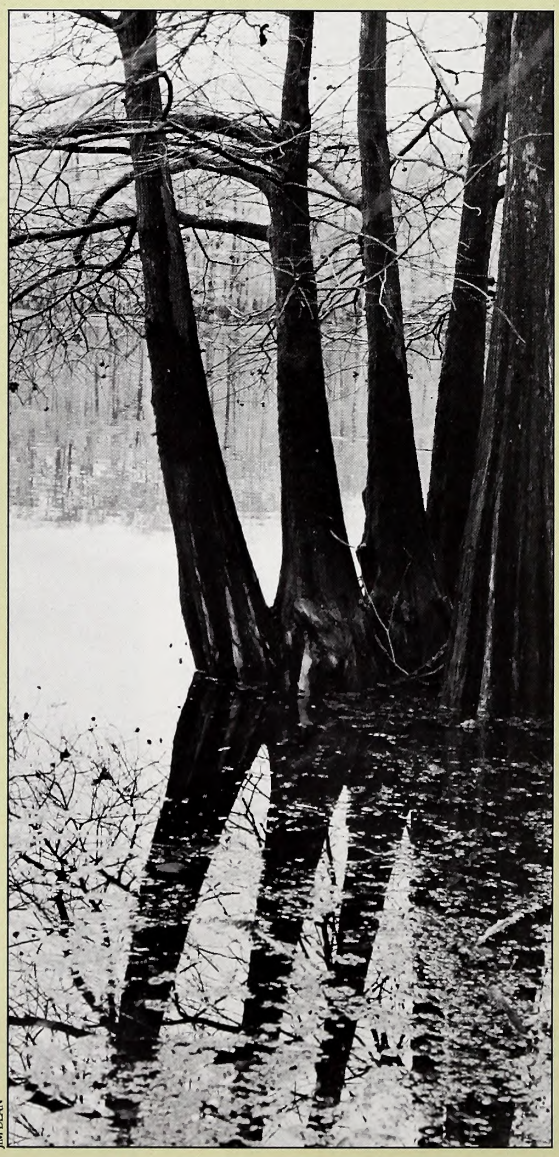
# "Rode Down Thro' the Neck"

A horseshoe bend in the Roanoke River in Northampton County cradles Occoneechee Neck and its wonderfully isolated "muddle" of history and wildlife.

written by Bland Simpson ©1991

*The* muddle *it seems is a dish peculiar to Roanoke & is made of the rock fish, ham, & red pepper stewed together. The table was arranged under the trees. It was of rough boards uncovered with a cloth... There were two barbecued pigs, two boiled hams; the muddle, served up in a bake kettle, that is, the kettle stood directly upon the table, a large sturgeon, served up in a bread trough, & dishes of fried fish. This was all.*

Anna Greenough Burgwyn,
on a Garysburg, NC,
Fish Fry, May Day, 1841



JIM DEAN

***Old homes and plantations*** *along the Roanoke River were often built on pillars so that the treacherous spring floods wouldn't wash them away. Upstream dams first built in the 1950s have greatly reduced the Roanoke River's notorious annual flooding, but water still rules in Occoneechee Neck. Gumberry Swamp (right) on the eastern edge of the Neck is typical of the area's priceless wetlands.*

A hundred and fifty years later, almost to the day, two hungry men stood in a wet road just behind the Roanoke River levee, miles deep in the big bottom that is Occoneechee Neck, some of it still belonging to the family named Burgwyn. Besides the food cooler they had failed to haul in with them, *their* muddle was figuring whether to make a sally on the next slough or retreat through the one that moments before had nearly sunk their Volkswagen.

"I tell you what," said Doug Rader, the colorful, redhaired biologist who was exploring Occoneechee Neck with me last May, "This road is an interruption in the water, not the other way around. This is *wet land*."

"Well, if we got to get stuck, Doug," I said, anticipating the query from an as-yet-to-be-made acquaintance, some man with a tractor or a winch-rigged four-wheel who would ask us politely if we were ignorant or just plain stupid, "I want us to be in the *first* mudhole, not the second."

It was a bright blue-sky day, clouds billowing, and we were having a big time trying to find a breach in the levee, some sandy skid to slide the johnboat down into the Roanoke. From Garysburg, we had headed south on SR 1128, expecting to gas up the Ted Williams seven-and-a-half and find pimento cheese and sardines at Mud Castle. And we thought the hummingbird hovering under a porch chair at the first turn was a good omen.

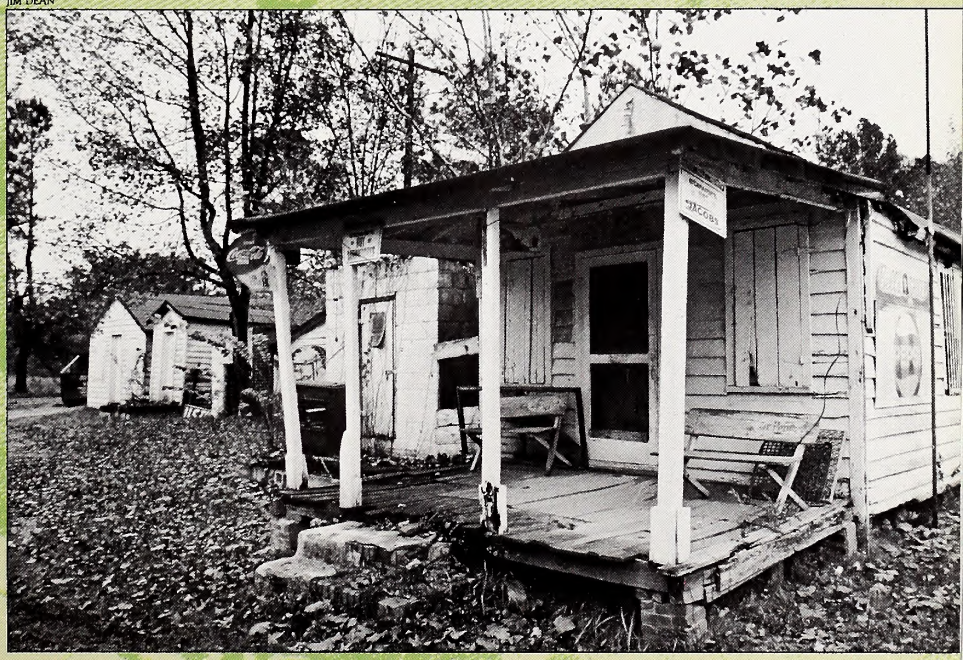
*Eat More Peanuts*, said one sign at the only grocery down the way, and another implored us to *Grow and Use More Cotton*. Fine, but the store was closed, had been for some time, so all the peanuts and cotton we would see this day were what was in the ground.

On our way back into the Neck, there were buttercups, wild geraniums, lyre-leaved sage, an indigo bunting, a sandy road snaking along between a cotton field and a pineywoods. We drove past a short-bus

JIM DEAN

***Some of the land** in the Neck is still owned by the descendants of Henry K. Burgwyn, the boy colonel of the Confederacy. Cotton was once king here and is making a comeback. Today, soybeans (left), peanuts and corn grow in huge fields on ridges between the old riverbed oxbows. Now closed, the old store in Mud Castle (below) remains a familiar landmark in the Neck.*

JIM DEAN

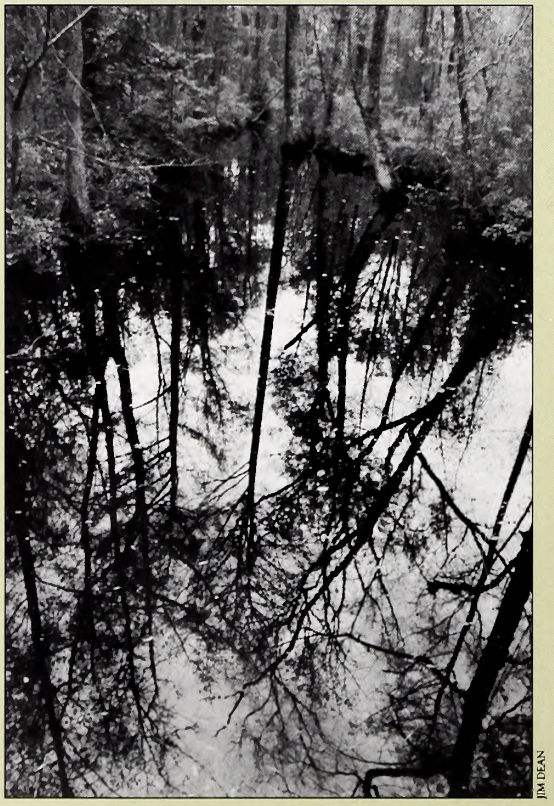


***Just upstream*** *from Occoneechee Neck at Weldon, rockfish (striped bass) spawn each spring in the Roanoke River. In years past, you could almost walk across the river on the boats (right), and some local businesses still close during the peak of the rockfish run. With their feet forever wet, cypress and tupelo grow along Occoneechee Creek (below) which marks the upper boundary of the Neck.*

JACK DERMID

hunt camp and kennel and a tiny pond where a great blue heron lifted up, a borrow-pit where turtles sunned and swallows nested in dark, round holes in the pit wall. Then we wound around through what was swamp forest till the 1980s, now gum and tulip cutover with a lot of heart-rot stumps and deerstands in the trees every quarter-mile or so. A second indigo bunting.

The Roanoke made this neck of land as it swung out, curving ever westward, till it met the strong and high rock boundary on the *west* side. The river may have once made its main bed of Occoneechee Creek, which meanders southeastward from the upper part of the Neck to its empty into the Roanoke just upstream, of Gumberry Swamp and Camassia Slopes. Far easier to read than the palm of one's hand is the record of Roanoke River's ever-increasing arc, writ clearly in the disposition of streams, sloughs, ponds and contours of the flood-plain Neck on the Halifax quadrangle.



JIM DEAN

Doug and I studied the contours of our own situation, then engineered our way around and back out past the 20-foot slough that had slowed us, but not before we walked about through the standing water and muck of the levee road. We saw a crawfish, a water boatman, a frog in the second slough, tracks of deer and tracks of coon, heard the tattoo of a pileated woodpecker, and we inadvertently interrupted the rites of spring by slogging in on a pair of mating black snakes—one went Doug's way, toward the river; the other slammed into my left boot with justifiably righteous indignation before disappearing into the bog. "Monster," Doug called a poison-ivy vine the better part of a foot in diameter. Near a wide-plank canal bridge we jumped two young deer and saw a third indigo bunting—as many in two hours as I had seen in my life.

As Anna Burgwyn said in another time of a different bounty, "This was all."

***"Rode down thro'*** the neck," wrote Henry King Burgwyn in his journal, June 20th, 1840.

Burgwyn and his brothers had only the year before inherited the Roanoke bottomlands called Bull Hill, Occoneechee and the Level, and Henry and his wife Anna—Yankees both, from New York and Boston—had made their way to Northampton County and the Neck in the spring of 1840. In mid-April, Anna wrote home:

"Henry drove me out to his plantation last Sunday, for the first time... The situation for the house is beautiful. On a hill, at the foot of which there is a pretty little stream, & its sides are covered with trees enough to protect us from all sun or wind... We saw wild turkies as we passed along the road, & the mill pond is the rendezvous for wild ducks, so that we can there procure food for the body as well as the mind."

For a time, Henry Burgwyn took an interest in fox hunting and horse racing, but after brother Collinson's death in 1842, the business of planting the Neck absorbed him and brother Tom almost entirely. The Burgwyns studied agriculture, employing deep plowing, sub-soiling, liming and clover-growing to make the Neck produce. And to get that produce to market, they promoted Roanoke River navigation. In December of 1843, the schooner *Jno. C. Demarest* lay up at Occoneechee Neck, there to bring lime in and carry Burgwyn corn out to New York. In their first two decades in this country, the Burgwyns shifted the cropping from cotton to corn and wheat, Henry bringing one of the first two McCormick reapers into the South (below Virginia) and estimating his 900-acre wheatfields would yield 20 bushels to the acre, $50,000 in 1855.

These legendary planters tried hired Irish labor as an alternative to black slavery, but they gave up on this and became ardent defenders of the Southern order. In March 1856, agrarian editor and slavery advocate Edmund Ruffin visited the Burgwyns, and in August 1860, Henry Burgwyn joined Ruffin's "Publication Society" to speak up and write for the

ave South in which he had prospered.

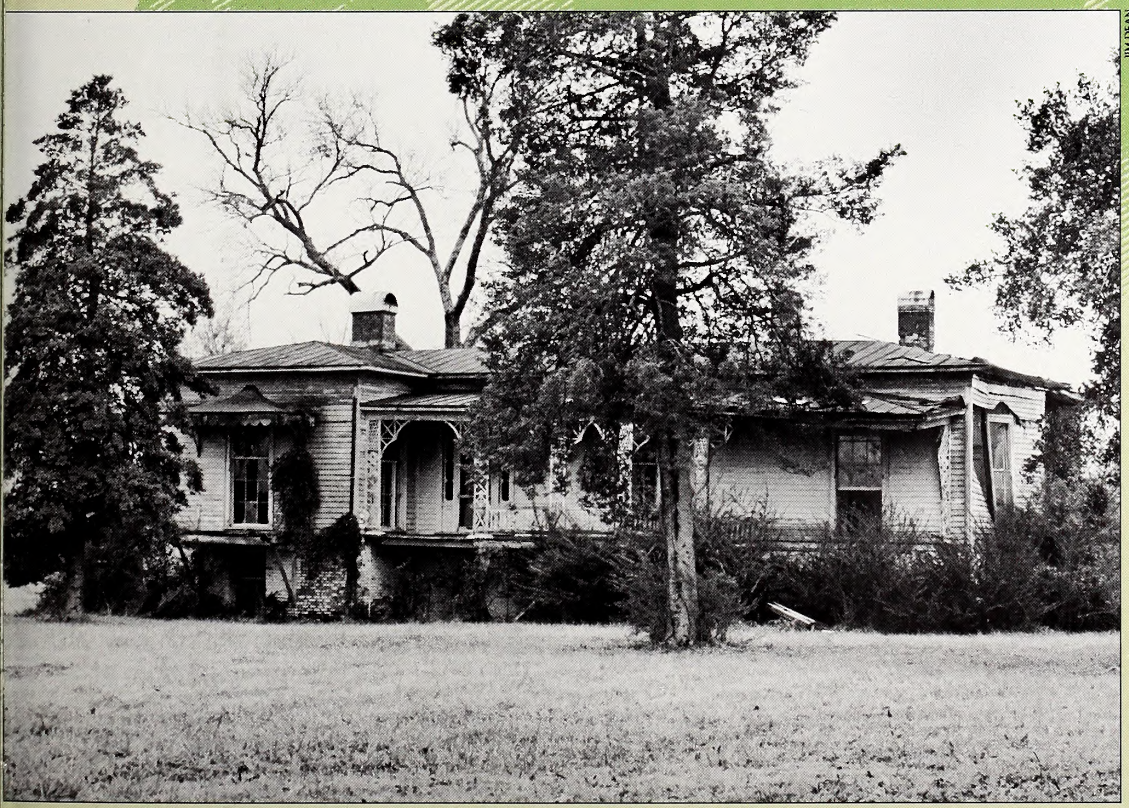
The Burgwyns would pay a high price for their outh. Less than three years later, on the first day f Gettysburg, July 1, 1863, Henry Burgwyn Jr., fell ith most of the 26th N.C. Regiment and died. He as, at 22, one of the youngest officers of the ill-fated my, and history knows him as the "boy colonel of he Confederacy."

Better fortunes, though, for those in the Occo-eechee Neck adventure novels of the boy colonel's ore recent kinswoman, Mebane Holoman Burgwyn. he Mud Castle store was open for Cal and Mike in *Hunters' Hideout* (1959), and the brothers—torn etween studies and the glories of the swamp—xplored cliffs, jungles and undercut banks before apturing a shaky-handed jewel thief down by the ver. And the Roanoke itself, "relentless red estroyer of crops as it flooded the Occoneechee leck," was a major character in *River Treasure* (1947), estoring a branch rerouted by the great flood of 1877 ng enough for 12-year-old Guy to find a chest of ivil War silver and win for his drowned-out family he down payment on a new farm.

"Been looking for that treasure all my life," said Villiam Johnston, the easy-going planter whose flat o slightly rolling cotton-and-wheat lands at the heart f the Neck include such former Burgwyn holdings as he Cypress, The Level and Occoneechee Wigwam, dding,

"Haven't found it yet."

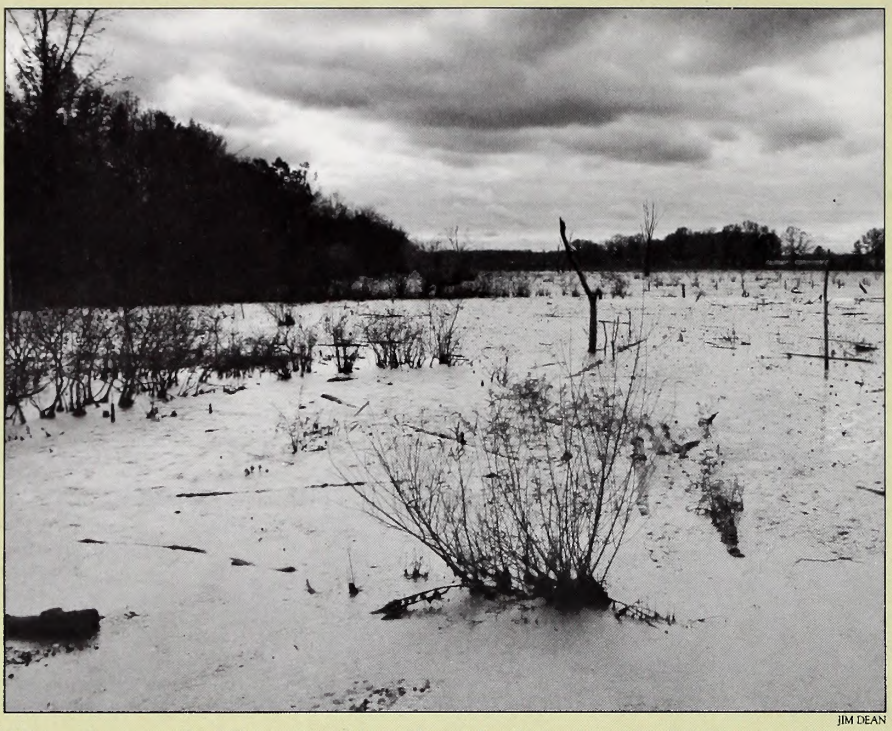
***As Johnston bade us welcome*** to do, we drove hrough the farm, through the long slender cypress onds of his family's Occoneechee Hunting Preserve, hen walked the johnboat through his hip-high wheat at the end of a long lane down to the river.



JIM DEAN

NC STATE ARCHIVES

***On the fringe of the Neck,*** *the deteriorating home of Confederate General Matt W. Ransom is visible from U.S. 158. Its architechture with airy porticos may have been influenced by Ransom's tour as minister to Mexico.*



JIM DEAN

***Throughout much of the Neck,*** *the Roanoke River has alternately cut, then abandoned, riverbeds that are strung like beads with countless beaverdams, creating prime wetland habitat that is home to many species, including some birds seldom seen anywhere else in the state. Tradition holds that a chest of silver was buried in the Neck during the Civil War, and lost when flooding moved a channel.*

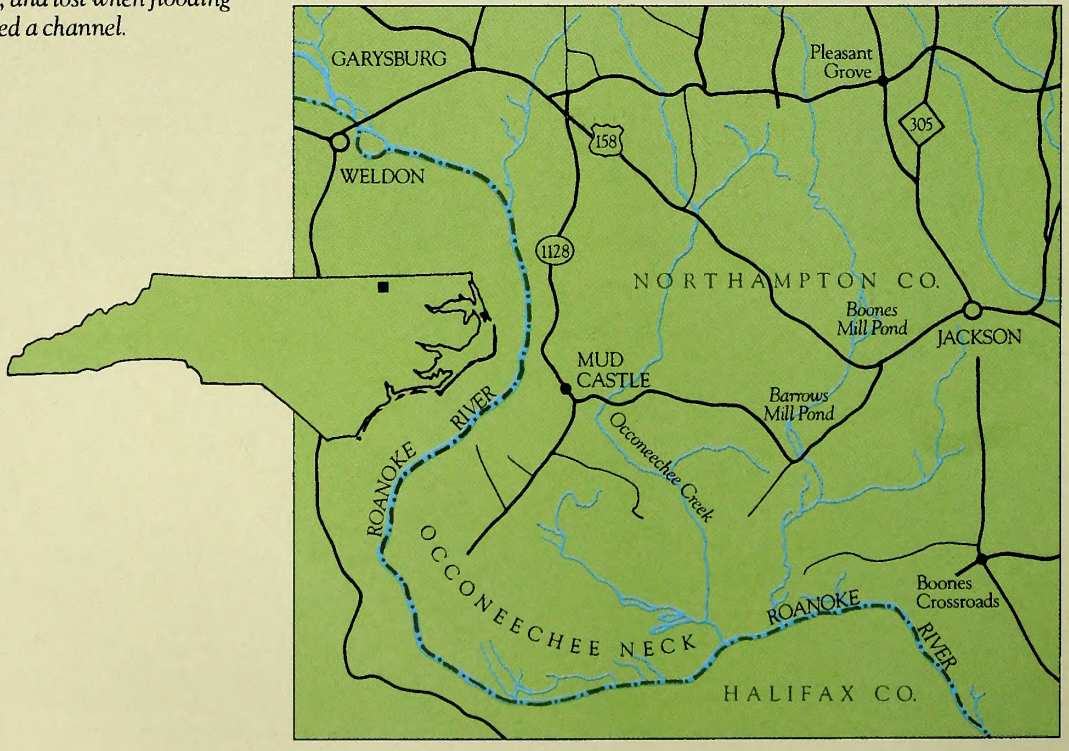
We made our landing where the bank was not sheer bluff, but was an easy place beside a willow.

It is a good thing to put one's boat in and onto riverwater where it has never been. I have crossed the Roanoke by car all my life, can never remember not knowing the sight of the big swamp through which the Williamston-to-Windsor causeway cuts, but I never before set afloat below the dam, where it still *is* a river. There was a real thrill to it, something learned the moment we cast off, in the several seconds adrift before the motor fired and we were once again in partial charge of things. If your boat is a small craft with a small engine, you really are *in* that water, *of* it, under no delusion about what constitutes the superior force. The motor winds faithfully along a riverine landscape of ash and sugarberry, sweetgum and sycamore, unfolding before you, and the delight of the sun and slight breeze the boat's motion affords and the smell of the river, of mud and fish and May water warmer than not, all merge. And then the boat slows, or slides forward slightly faster than it should, or shifts course two or three or five degrees, none of it your doing, your hand steady and unvarying on the throttle, and you know you have *felt* the River, as it eddies or rushes to the Sea of Roanoke, the Albemarle Sound, then more slowly to the real sea herself.

We went with the big flow downstream, crossing to take a look at a muskrat's hole in the high bank opposite the Neck, a confetti of freshwater mussel shells the rat had been feeding on showered down into the mud below the nest. Small wonder that Occoneechee trapper Q. J. Stevenson sometimes baits his muskrat traps with mussels. There were two fishermen with cane poles a ways on, and a great blue heron that flew ahead, and then an osprey.

"The return of the osprey to the East is a big story," said Doug, warmly, enthusiastically. "A wonderful story." I would remember his remark, and how he said it, just a week later down on Great Lake in the Croatan when I climbed out of this same boat up into a cypress and peered into a low-built osprey nest, where three young pumped hard, lung and heart, against the mid-May heat. Right now, it was quite enough to see the one majestic bird gliding along the river at Occoneechee Neck.

Merrill Lynch, The Nature Conservancy's veteran Roanoke explorer who had given Doug the maps we were using and who hails from nearby Roanoke Rapids, salutes the Neck: "Some of the richest birdlife we have is down there. The Mississippi kite, an insectivorous hawk that feeds in the air, is a Southern species from down along the Gulf—its most northern range is along the Roanoke at Occoneechee Neck. The cerulean warbler, that occurs only in mature bottomland, it's there. In the mature floodplain forest sandwiched between the Burgwyns and Johnstons, there's a heronry, full of great egrets and great blues. And the turkeys were never hunted out down there, so what's there in the Neck are natives, native genes."




***Up high-banked Occoneechee Creek,*** we roamed a bit, cutting the motor and drifting, listening to a thrush, a dove, cattle lowing. Then we wound downstream past Gumberry Swamp and, near three fishing women, tied up at the base of the great Camassia Slopes, got out and climbed.

This is the Roanoke of relict plants the ice sheet sent our way, a steep land unique in North Carolina, with its flowering herbs spring beauty and toadshade, wild blue phlox and the white buttercup false rue anemone, and a poppy called Dutchman's breeches. And although we were too late to see the lavender bloom of the *Camassia*—the wild hyacinths that are here and virtually *only* here in North Carolina —Doug and I took no small pleasure in what we did see: an 8-inch worm snake hiding beneath a piece of plywood, the resurrection fern adorning an enormous oak just up the slopes from a green tarpaper shack, buckeyes, May apples, Christmas ferns, *Sagittaria*, arrowhead, jewelweed, a slope of chickweed and *galium*, a skink, the lower half of a gas burner waffle iron, a leggy beech tree, a sycamore 4½ feet in diameter, and a beautiful glade.

The glade was a flat pocket in the Slopes, a terrace only eight paces wide, a little boggy bottom perhaps 30 feet above the level of the river, and at its river-end stood a cypress nearly 100 feet tall, knees formed up out of the wet ground all around. We mused upon the knurled figures before us and upon the attitudes they might portray, of supplication, of embrace, till Doug remembered:

"My mother once made a nativity scene," he said, "all out of cypress knees."

"I can see it," I said, and I could, as he laughed not only to himself in appreciation of that memory. And I could see the tiny cottontail shivering in the blue-eyed grass in the road that comes down the Slopes, the pink-and-red honeysuckle ambushing the small trees, the tiger beetle on the ground, the big coon prints in the soft, flat mud beside the river where we soon untied our boat and moved out again.

More great blues rose croaking at our slow approach upriver, wood ducks in twos and threes skittering over the Roanoke, too, a single kingfisher sitting grandly atop a dead-white sapling spire at the mouth of Occoneechee Creek. In a little while, Doug and I would pull the boat out, noting and wondering about the several deer skulls and vertebrae and other bones in the river mud at our landing, then for a time traipsing one of Johnston's fields of emergent cotton looking for points, the same field where he found an Indian grinding stone, and finally heading up towards Mud Castle and home.

***Before we came up*** off the Roanoke, now lightly coated with cottonwood fluff, we stopped briefly beneath a huge raft of wild white roses cascading off the far bank. They were just out of reach, too high to pick, though their sweet and heady scent for these moments covered the river.

It is all too little a while, I thought. A trapper and his daughter once found a mastodon's tooth in a creek bank near here, held in their hands that piece of the ancient elephant and gazed into the mouth of many thousands of years gone by. A steamboat captain was pleased one ante-bellum New Year's Eve that his 20-horse *Pilot* had made Occoneechee Neck from Norfolk in 50 hours: no time at all. A boy who came of age in the Neck died for a two-year-old nation that would itself be a memory less than two years later.

JIM DEAN

This boy colonel lies atop an oak-tree hill in Raleigh, far from and unlike this waterland portion of our realm, though perhaps in nearer mud and clay lie those hands whose labors sent the colonel to school in Philadelphia before this state sent him to his end at Gettysburg. And the creatures that breed here, whether rare like the cerulean warbler or not, do so innocent of these affairs, as do the rockfish spawn, eggs drifting downstream from the rapids at Weldon toward Palmyra and Hamilton to hatch, some of them someday bound for a cast-iron pot and someone's famous old-family-recipe fish muddle.

From this neck of land called Occoneechee and the rugged river that curved and curved and made it, a Roanoke rose for them all. ⊠

***On the western edge** of the Neck, Longview Plantation has been continuously owned by the same family for two centuries. The lane to this gate is flanked by some of the oldest pines in the state.*

# *Saving* SEA TURTLES

Volunteers are the backbone of an innovative program to protect the sea turtles that live off our coast and breed on our beaches.

written by Tom Henson and Karen Beasley
photographed by Ken Taylor

The moment of emergence arrives! The first head appears, followed quickly by another and another. They look like popcorn in a popper as they scramble over each other and up over the lip of the nest. They pick up momentum as they head for the sea. The first one hits the water!

What an exhilarating experience to see these plucky little turtles, looking for all the world like wind-up toys, make their run to the sea. As the last turtle disappears under a wave, it is not unusual for spontaneous applause to break out from onlookers along with cries of "Good luck!" Everyone knows the incredible odds these hatchlings face. It's hard to believe that this entire event, so long anticipated, takes less than 15 minutes. And hard to believe that the few lucky ones will grow from these tiny creatures to 350-pound giants of the sea.

Scenes like this occurred 140 times in 1991 on Topsail Island. We know the exact number because Topsail is the site of one of North Carolina's most successful sea turtle nest-protection projects. The Topsail Island Sea Turtle Project is an all-volunteer group founded by Karen Beasley and directed by her until her death last July. Today, the Project's activities continue under the direction of Jean Beasley, Karen's mother, and a growing number of committed volunteers. It's one of 17 projects that surveyed and protected sea turtle nests in North Carolina in 1991 under the auspices of the Nongame and Endangered Wildlife Program of the N. C. Wildlife Resources Commission. During the 1990 season, these projects tallied arecord 805 turtle nests along North Carolina's beaches and the 1991 season promises to yield similar results.

The Topsail Turtle Project begins in earnest in early spring when sea turtles return to inshore areas with the warming of the water. At an organizational meeting, mobilized volunteers plan complete coverage of the beach. Training of new volunteers is planned by those experienced in the strict regulations and procedures that must be followed when working with a species protected under the Federal Endangered Species Act. Printed material and other equipment are inventoried to be sure supplies are adequate. Once the season is underway there will be no time for these kinds of activities.

In early May, the volunteer beach walkers begin their daily surveys. Turtles don't nest until around mid-May, but everyone is anxious to get started. What are they looking for? Tracks—and they're easy to identify. One vacationer to Topsail Island will never forget what turtle tracks look like.

She arose early one morning to see strange markings on an otherwise unmarked beach. Alarmed, she called the police to request that they come and investigate because obviously someone had driven a tractor into the ocean. She was relieved and fascinated when she learned that the marks were made by a turtle. The previous night a sea turtle had nested by the steps of her rental cottage.

Sea turtles usually lay their eggs in the wee hours of the night, so few people have ever seen a female turtle as she comes ashore to dig her flask-shaped nest and deposit her eggs. She uses her back flippers with great dexterity to dig a cavity as much as 2 feet deep. When she has emptied her egg pouch, she will throw sand over a large area to disguise her nest before she drags herself wearily back to the sea.

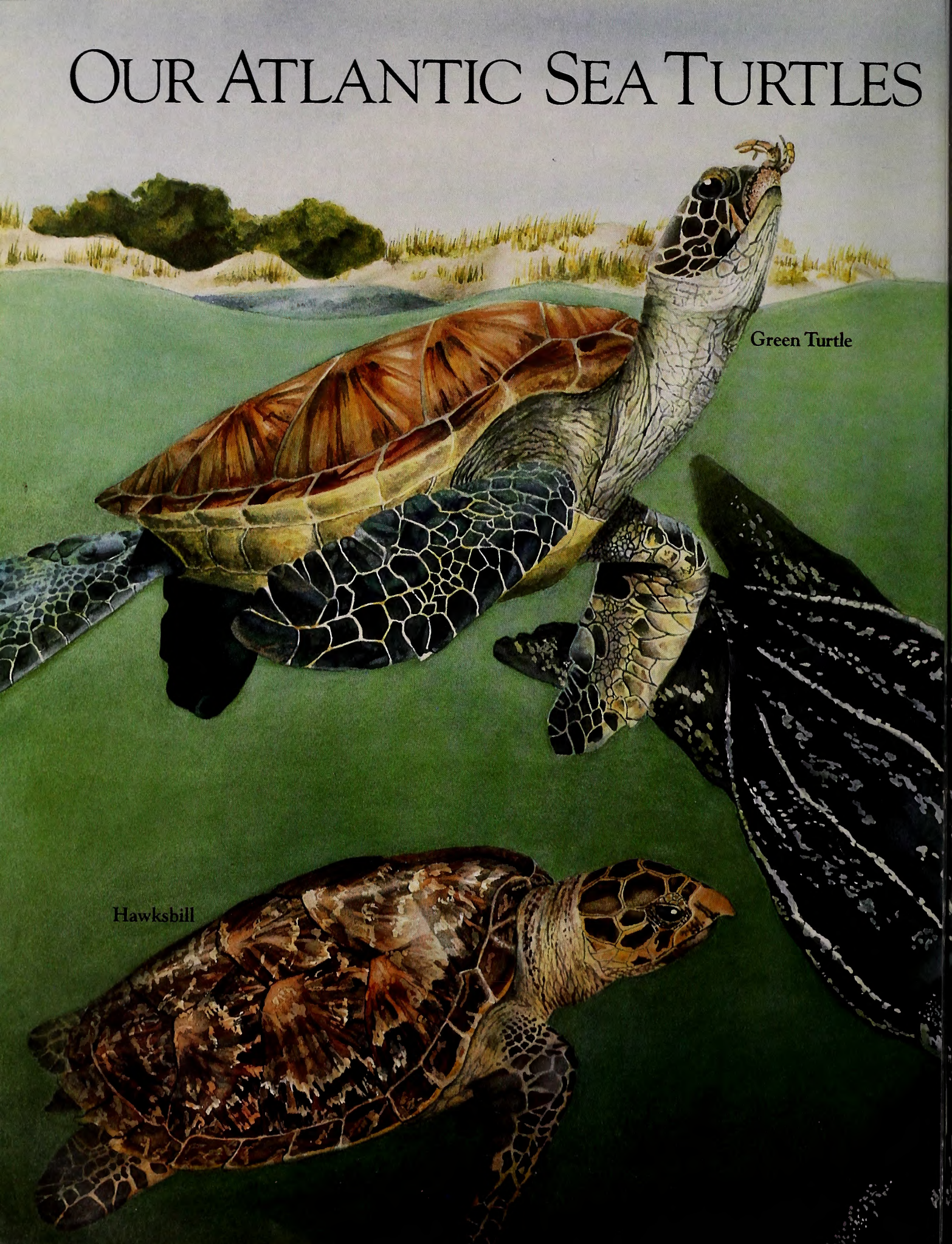
The Topsail Turtle Project covers 26 miles of shoreline and the assistance of the three local town governments is indispensable to turtle volunteers. In Topsail Beach, the town maintenance crew monitors the beach each day and reports sightings of tracks to the Project. Policemen from North Topsail Beach and Surf City as well as Topsail Beach report nesting turtles on the beach and often stand by to make sure that the turtles are not harassed in any way while they are nesting.

When a report of turtle tracks on the beach comes in, Project volunteers investigate the location of the nest to make sure that eggs were laid. They also evaluate the nest's chances of success based on its location. Considerations include its distance above the tide line, human traffic patterns in the area and the presence of artificial lighting that may confuse hatchlings upon emergence and lead them away from the water. Nests that fall in high-risk categories are carefully relocated to safer spots. All nests are marked and monitored by the volunteers.

The majority of sea turtle nests in North Carolina are laid by loggerhead sea turtles, but some numbers of green sea turtle nests are normally laid each year as well. Each female nests several times during a season

***Members of the** Topsail Island Sea Turtle Project mark off the site where a sea turtle nested the night before. Bulldozer-like tracks were left by the turtle as she crawled from and returned to the sea. Left to right, Karen Beasley, Jean Beasley, Boyce Kay and Beverly Green.*

# Our Atlantic Sea Turtles



Five of the world's eight marine turtle species appear in the coastal waters of North Carolina.

illustrated by Patricia Savage © 1991

# North Carolina's Sea Turtles

Among the most endangered animals in the world are the giant sea turtles. These marine creatures have been decimated in some cases by uncontrolled harvesting and in others by the gradual disappearance of nesting habitat caused by coastal development. Of the five turtles that appear in our coastal waters, three are federally listed as endangered species and two are listed as threatened species.

**Green Turtle**
*Chelonia mydas*
30-60 in.; 220-650 lbs.
Status: Threatened

Found throughout the Atlantic Ocean, from more northern latitudes to as far south as Argentina and South Africa, the Atlantic green turtle occasionally appears in our coastal waters. On rare occasions it nests here.

Adult females nest several times a season, but only once every two or three years, mostly in May and June. Each nest may contain about 140 eggs. The baby turtles hatch in about 45 to 60 days. They are sexually mature when they are from 5 to 13 years old.

The green turtle is the one sea turtle species most adapted to eating plants, although it will also eat animals such as crabs, clams, sponges and jellyfish.

**Hawksbill**
*Eretmochelys imbricata*
30-36 in.; 80-280 lbs.
Status: Endangered

This small sea turtle ranges widely through the Atlantic, Pacific and Indian oceans, although it is rare in North Carolina's waters. The smooth edges of its jaw give it a raptor-like look, hence its name.

The shells of hawksbills were once the source of tortoiseshell, a substance used in making ornamental objects. As a result, this turtle has undergone widespread exploitation.

The hawksbill eats a variety of mollusks, sea urchins and even Portuguese man-of-war.

**Loggerhead**
*Caretta caretta*
31-47 in.; 170-500 lbs.
Status: Threatened

Although not the largest of all sea turtles, the loggerhead is the largest hard-shelled sea turtle, with a few growing to weights of 1,000 pounds. It is also the most common sea turtle in our waters.

Adult females nest every two to three years. Over a two week period in their nesting year, they deposit perhaps a half dozen clutches of eggs in cavities about 2 feet deep located along the base of the first dunes. The average clutch size ranges from 64 to 341 eggs.

Craftsmen once prized the leathery outer covering of both the loggerhead and the green turtle.

**Kemp's (Atlantic) Ridley**
*Lepidochelys kempi*
23-30 in.; 79-110 lbs.
Status: Endangered

The ridley is the smallest sea turtle in the world and one of the most endangered. It is a rare visitor in our coastal waters as it ranges from the Gulf of Mexico, up the East Coast and east to Europe.

Its nesting is a spectacular affair. On a single day, tens of thousands of females come ashore in daylight on a beach in Tampico, Mexico. Although the slaughter of ridleys by human predators at this vulnerable time has been partially controlled, the ridleys are still endangered worldwide.

**Leatherback**
*Dermochelys coriacea*
46-70 in.; 650-1,500 lbs.
Status: Endangered

The largest of all sea turtles, the leatherback differs from others in having a soft, leathery skin. It is further distinguished by the seven longitudinal ridges on its upper shell.

This turtle is the most accomplished swimmer of all sea turtles, known to wander far in the open seas. It is an omnivorous feeder, eating sea urchins, crabs, mollusks and plants, and apparently relishing the poisonous Portuguese man-of-war.

## You Make a Difference!

NORTH CAROLINA NONGAME & ENDANGERED WILDLIFE FUND

Your donations to the Nongame and Endangered Species Program mean that many endangered species have a chance for survival. Please keep giving. Make your contribution directly or through the state income tax checkoff to the Nongame & Endangered Wildlife Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27604-1188.

but may nest only every two to four years. Data submitted to the Wildlife Commission indicate that the average number of nests per female is about four a year.

After 55 days, hatching is imminent and volunteers intensify their monitoring efforts. Some "nest-sitters" spend night after night on the beach watching for telltale signs of hatching. This, too, has its rewards. The beauty of the beach and ocean at night is breathtaking. As the time for emerging draws near, volunteers rake the beach free of anything that might impede the turtles' trip to the sea. They alert the inhabitants of neighboring houses to keep their outside lights off and build berms of sand along each side of the nest to keep excited viewers from getting in the path of the turtles. Onlookers are instructed on what to expect and what is not allowed near the nest area—flashlights, flash cameras, and insect repellent are among the prohibited items. No one is allowed to pick up or touch the turtles. The volunteers will assist hatchlings only in rare circumstances when they are threatened by predators or attracted to artificial lights.

Finally, after about 60 days, hatching will begin. Deep in the safety of the nest so carefully crafted by the female turtle and warmed by the sun, the turtles break out of their eggs. They may spend several days in the nest absorbing the egg yolk marble which is still attached to their abdomens. This yolk sac is the only source of energy for the hatchlings during the first several days of their lives when the strenuous tasks of digging out of the nest and crawling to the sea will take place.

The first step of this epic journey is taken when, triggered by an unknown signal, the turtles begin to move within the nest. Dozens of tiny flippers loosen the sand above them and as the sand filters down through layers of turtles, the floor of the nest gradually rises until the turtles are very close to the surface. They normally remain there until nightfall. On the beach, volunteers and excited onlookers watch for the tell-tale movement of sand or the cave-in that means the hatchling turtles are about to emerge.

Three to five days after the little hatchlings

have scrambled into the sea, volunteers dig up the nest. They count the number of eggs in the nest and calculate the hatching rates and emergence rates, figures that are included in an annual report to the Wildlife Resources Commission each year. As required by the Endangered Species Act of 1973, the Commission issues permits for those working with sea turtles and all activities must be reported. These reports provide valuable information on sea turtles in the state.

For example, based on complete data from 505 nests throughout coastal North Carolina, this is what we know about sea turtle nesting in 1990:

- Nesting turtles had an average clutch size of 119.
- Out of a total of 60,687 eggs laid, 47,428 hatchlings escaped from the nest for an overall rate of 78 percent.
- Relocation was necessary for 275 nests threatened by flooding or human activity on the beach.
- Loggerheads accounted for all nests except nine laid by green sea turtles.

Aside from compiling data like these, the Wildlife Commission's Nongame and Endangered Wildlife Program helps coordinate sea turtle volunteers and the Sea Turtle Stranding and Salvage Network. The primary objective of the Network is to collect information on sea turtle mortality. Dead sea turtles are often washed up along the beaches. Some have succumbed to natural causes, but about 90 percent of the stranded turtles die after being hit by boats or snared in commercial fishing nets. Network members—public agency employees and private volunteers—distribute stranding report forms, compile completed reports and report strandings to the National Marine Fisheries Service in Miami. Based on completed forms from 98 people, a total of 285 strandings were witnessed in 1990, the highest number on record. These strandings included 233 loggerheads, 11 leatherbacks, 19 Kemp's ridleys, and 17 green sea turtles. The species of five turtles was not determined. Virtually all the volunteers working on nest projects are also involved in the Stranding Network.

## In Memoriam

Last July, co-author Karen Beasley (in straw hat, at right) died after a long illness. She was 29 years old. On the Saturday before her death, she was on the beach at Topsail monitoring her beloved sea turtles. Her passing saddened members of the Topsail Turtle Project who knew her as a tireless worker on behalf of turtle conservation. She was also deeply involved in many other environmental issues of the day. She will be sorely missed.

When asked what motivated the volunteers in the Topsail Turtle Project, Karen Beasley replied by quoting the project's motto: "Every turtle counts."

"Can we make a difference?" she asked. "Dare we hope that the sea turtles' plunge to extinction can be halted?" Her answer: "We must hope and we must act." A special thanks is extended to Jean Beasley, Karen's mother, who graciously consented to the use of her daughter's descriptions of the Topsail Turtle Project activities in this article.

The Nongame and Endangered Wildlife Program would also like to thank all those volunteers who contribute so selflessly to the success of the sea turtle program in North Carolina. We are totally dependent on you and would be ineffective without you.

The Topsail Turtle Project welcomes interest and participation in its activities. Write P. O. Box 2663, Surf City, NC 28445, or call (919) 328-1000.

Information from nesting surveys and the stranding network allows the Wildlife Commission and other agencies to address the way that environmental concerns relate to sea turtles. For example, in reviewing permit applications for coastal development, Commission biologists can recommend regulations that protect turtles. A vital function of the Nongame and Endangered Wildlife Program is to provide technical guidance to other agencies and individuals on sea turtle management.

Thanks to The Topsail Turtle Project and other volunteers across the nation, a healthy proportion of hatchling turtles are making it to the ocean. Yet though critical, these steps address only part of the turtles' problems. Stringent measures must also be taken to protect the adult and young segments of the sea turtle population, according to a report issued recently by the Committee on Sea Turtle Conservation of the National Research Council. Public agencies dealing with commercial fishing as well as recreational fishing and boating are now in the process of developing those measures.

As a result of all these measures, and the many volunteers who selflessly pursue the cause of our marine turtles, the future of sea turtle populations is looking somewhat brighter. ☒

# Smoking 'Em

Introduce your ducks and other game to a piquant marinade and a few hours of smoke. They'll get along splendidly.

written by Eddie Nickens © 1991

This was no mere fish duck. Oh no. This bird was a mission. I'd shot it with one of those corner-of-the-eye, holy-cow-there's-a-bird-over-the-blocks sort of snapshots, and now here it lay in a yellow plastic dish drain, leering at me with its toothless, serrated bill. Mr. McGreaser—the hooded merganser. I'd shot it, and now I'd eat the thing.

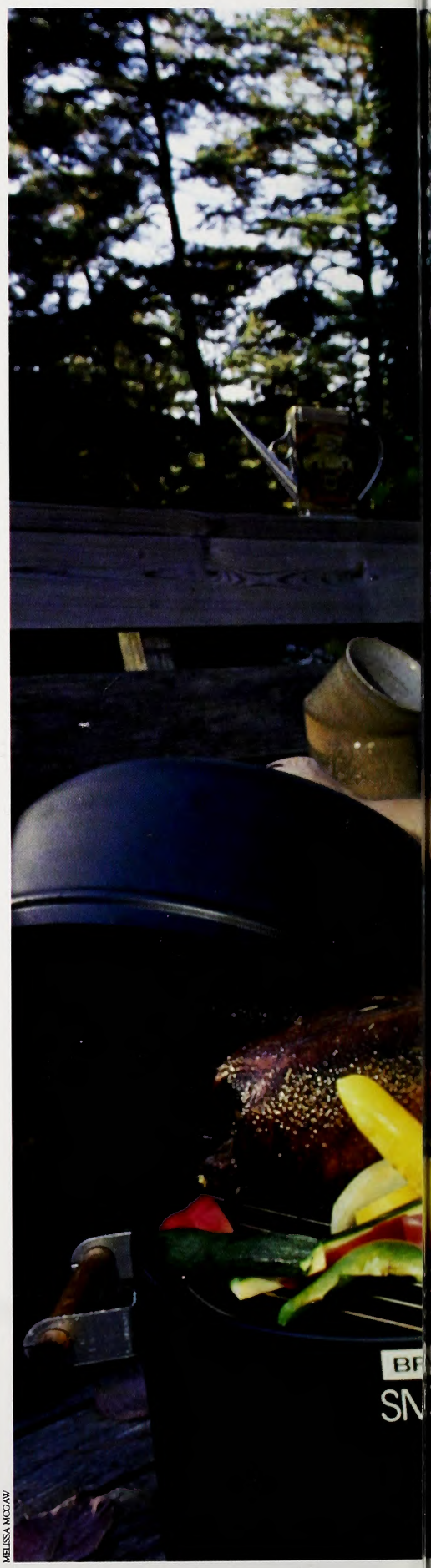
But how? What would I do to turn palatable this piscatorial pirate among waterfowl, a bird unworthy, by modern standards, of the table? No sweat, I quickly thought. I'd jerk this merk. And thus began another chapter in the education of an outdoorsman.

First I breasted the bird, along with a brace of mallards and a black duck from the previous day's swamp hunt. Then I carefully sliced thin jerky-shaped fillets from the breast, taking pains to cut with the grain. I placed these morsels into a marinade of soy sauce, brown sugar, red wine, pink peppercorns, yellow onion and dried scrapings off the top of an old spice jar hand-labeled "Chinese." Hmm. And then into a smoker for three hours and 28 minutes, or four hours and 16 minutes, or somewhere between the two. The result? Mallard jerky moist and pungent. Black duck jerky with just the right pepper-bite. And merganser jerky as vile as any concoction the hand of man ever wrought.

Oh, well. So the merganser still wasn't fit for public mastication. The important thing was that I had another index card to add to my growing collection of smoked meats recipes. I filed this one under "Anything-But-Merk Jerky." Burn and learn, I've started to say.

Indeed, I've been turning to my smoker more and more when I have wild game on the brain (and desire it soon to be on the palate). I've discovered that smoking wild game can be one of the easiest, most fun and finest-tasting ways to prepare just about any critter that finds itself, mostly by accident, in front of my gun barrel or beneath my bobber. Venison, goose, duck, turkey, squirrel and frog legs, have all been bathed in a smoky brine and brought to table successfully, with little fuss, just a bit of muss, and a whole lot of napkins. Well, possibly the frog legs should have been fried. One guest described them as chicken-flavored rubber bands.

The theory behind smoking meats in a modern water smoker is a simple one. Remember the old charts in junior high biology that illustrated the cycle of the earth's water supply—how liquid falls in the form of rain, runs to the sea, evaporates and eventually falls again? Water smokers work in similar ways. In the bottom of tall, tubular



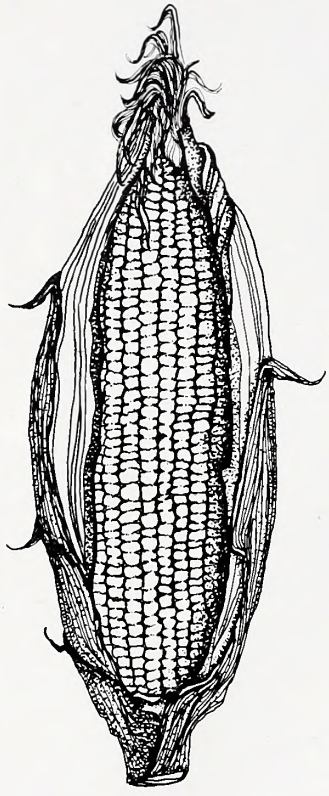
***Preparing a feast*** *for the eyes as well as the palate, the author smokes a goose, a duck and a spread of vegetables. Smoking game is increasingly popular—for good reason—and manufacturers offer a wide variety of smokers to choose from.*

MELISSA MCGAW

BRINKMANN
SMOKE 'N GRILL

# Smoking for Flavor

*When you're ready to add a little more flair to your smoke cookery, try these recipes.*



### *Bacon-Wrapped Quacker Breast*

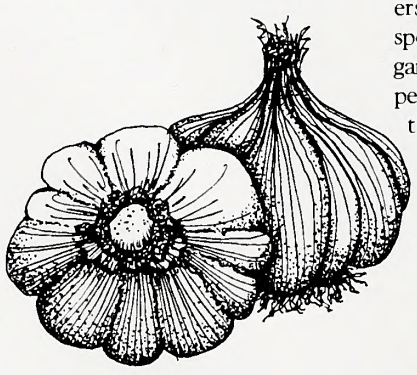
This is a friend's recipe I've recently adopted, and often I prepare wood ducks in this manner. Remove and skin breast fillets. Wrap each breast with a piece of bacon, fastening the bacon strip with several toothpicks. Marinate overnight in a mixture of one part red wine to one part Allegro-brand meat marinade. Add marinade to water pan. Smoke for two hours.

### *Duck Jerky*

This jerky is not the brittle, dry variety many people are accustomed to. Using this recipe you'll make small strips of moist, flavorful jerky that store well in small sandwich bags. Smoking with conventional water smokers does *not* preserve meat. You can't toss this jerky into your daypack and figure it'll be good when you find it there on the last day of the season. But with a taste this good, chances are it won't be around long enough to spoil.

Slice duck breast fillets with the grain into strips one-eighth-inch thick; partially frozen meat slices much easier than thawed or fresh. Mix to taste a marinade of soy sauce and brown sugar (or teriyaki sauce), fresh sliced ginger, tarragon, cracked black pepper and red pepper. Marinate the meat overnight, add marinade to water pan, and smoke for two hours.

For drier jerky, cook longer or remove the water pan after the first hour.



### *Venison Jerky*

Nothing to it. Slice with the grain into strips one-inch wide and one-eighth-inch thick. Marinate overnight in a mixture of red wine, soy sauce, brown sugar, black and red pepper and garlic. For dry jerky, smoke without the water pan, checking for consistency. For moist jerky, add marinade to water pan and smoke.

### *Smoked Fish*

The delicate flesh of fish absorbs the robust flavors of smoke cooking well. The trick is to choose a fish with firm flesh, such as tuna, mahi-mahi and the old standby, salmon. I've smoked bluegill with some success, but recommend that you cover the grill with pierced aluminum foil so that half your catch doesn't end up in the coals.

Fish marinades differ quite a bit from the red meat sauces. For white fish with a bite, try a lime and ginger marinade. To the juice of two limes, add a few slivers of fresh ginger, two tablespoons of cilantro, a touch of garlic and a quarter-cup of peanut oil. Marinate the fish for three to four hours and smoke until flesh flakes, up to three hours for large fillets, basting once or twice while cooking.

### *Wild Turkey*

This is everyone's favorite, especially mine because I used this recipe to cook my first (and only) wild turkey.

Squeeze the juice of two oranges. Stuff the turkey with quartered onions, orange rinds and chunks of celery. Make a marinade of the orange juice, equal parts dry white wine and water, a splash of Worcestershire sauce, bay leaves, marjoram and tarragon. Smoke for seven to 10 hours, adding more liquid after four hours, if necessary. The bird is done when the turkey leg moves easily in the joint.

### *A Bird in the Brine*

Game soaked in a brine mixture take on the salty, flavor-packed taste of many commercially smoked foods. The moisture in meats is replaced with the salt while immersed in the brine. Brining meats is time-consuming, but old hands at smoking might want to give it a try.

For gamebirds, a Chinese brine works well. To one gallon of water add one and-a-half cups kosher salt, one cup sugar, one cup soy sauce, fresh ginger and a teaspoon of Chinese spice mixture. Place gamebirds—this recipe was developed for ducks, but other large gamebirds will work as well—in a large non-aluminum, non-cast iron container, cover with brine and weight down with a heavy plate. Refrigerate one day. Remove the birds from the brine and pat dry. Fill the water pan with two cups of the brine and hot water. Smoke about four hours.

ILLUSTRATED BY KIMBERLY K. CHEEK

### *Smoked Vegetables*

What's good for the goose is good for the gourd—or the ear of corn, at least. Few folks realize that the old standbys of the backyard grill-fest will fare well under the dome of a water smoker. Baking potatoes will cook in four to five hours, and will self-baste with whatever marinade you've added to the water pan. Add ears of corn on the cob, silk removed, to the top smoker shelf one to one-and-a-half hours before the meat will finish. You can experiment with other vegetables, even smoke a shish kebab for an accompanying side dish.

### *Basic Cooking Times*

| | |
|---|---|
| turkey | 7 to 12 hours |
| quail | 1 to 2 hours |
| large ducks | 3 to 4 hours |
| small ducks | 2 to 3 hours |
| duck breast | 2 to 3 hours |
| goose | 6 to 10 hours |
| squirrel | 2 to 4 hours |
| rabbit | 3 to 5 hours |

smokers is a fire pan in which chunks of wood are placed. Just above that is a water pan that holds water or marinade. Above the water pan are two grills capable of holding up to 50 pounds of meat. Heat from the smoker is absorbed partially by the water and marinade that soon begin to steam, mixing herbs and spices with smoke. That pungent brew condenses on the meat and dome-shaped smoker top, drips back into the water pan, mixes again, steams, rises, marinates, mixes. Over and over again, infusing the meat with a rich, smoky flavor. (Even my merganser jerky had a rich, smoky flavor. Unfortunately, it also had a thick, fishy flavor.)

That combination of wet heat applied over long periods of time turns tough meats tender, keeps dry meats moist and ensures that it's virtually impossible to overcook most cuts. And most anything can be smoked—big game and small game, fish and fowl, even vegetables and cheese.

But don't take my word for it. Try it yourself. Here's how. Step one is to buy a water smoker. I have friends who get excellent results smoking food over low heat in a conventional kettle-type grill, but a store-bought water smoker offers a lot more possibilities. There are charcoal smokers and electric and propane smokers, each with advantages and disadvantages. For a few years I stuck by my first charcoal smoker, tending to the fire pan with additional pre-heated briquets every half-hour or so. Not until I started using my current model, an electric smoker, did I realize how much unnecessary grief I was going through. There are those who will stand by their charcoal smokers—and stand by them they will, all day long as the temperature starts to fall—but I've seen the light, and it looks like a power cord. (If you do choose to try smoking with a conventional grill, try using heat on one side only. Place an aluminum pan over the heat source, and fill with water or marinade. Arrange your meat on the top of the grate. You'll have to experiment, but you might be pleased with the results.)

Once you've set up your smoker, defrosted the meat, cleared your calendar for the next six hours and checked the wind direction to make sure you won't also be smoking your wife's new sofa, the fun begins with the water pan. Sure, you can fill the pan with water, but that's like eating vanilla ice cream. Let's make a marinade.

There are two schools of thought governing the use of marinades. One holds that marinades should be gentle and supportive, daring not to mask the meat's natural flavors, but adding bouquet and essence. The other counters that, by their nature, marinades are meant to add oomph to the meat. So pour it on! Go with double handfuls of spice, a couple of sliced onions and the rest of your beer. Now's the time to find out what is in all those other little bottles in your 48-bottle matched spice rack.

For dark meats such as venison, my basic marinade consists of two parts soy sauce to one part red wine, with rosemary, thyme and cracked black and rose pepper added for additional flavor. For more delicate meats, white wine replaces the red, the soy is weakened with water and I'll shift emphasis to sweeter spices such as basil and tarragon.

But the fun of smoking is in experimentation. As I write this, I've just finished a marinade of equal parts orange juice and fajitas marinade, plus a healthy dollop of pure maple syrup, all of which is laced with rosemary and thyme. Two fat mallards and three late-season squirrels are swimming in that soup, and are about to be put to a taste test.

That's the beauty of smoke cooking. It is, at best, an inexact science, and if I tell you to use one-half teaspoon of *this*, it's only because I seemed to use twice as much of *that*. There are basic rules I follow—such as using red-wine marinades for dark meats, white-wine marinades for light meats—but let whim and personal taste be your guide. Smoke cooking's popularity can no doubt be ascribed to the rage over mesquite grilling, but that western weed isn't the only wood worthy of the water smoker. Indeed, I've bought bags of chunk apple, hickory, oak and even grapevine chips, and used them all. Don't be afraid to burn and learn. Almost any hardwood will work, even trimmings from fruit trees. Just stay away from evergreens, whose piney woods leave a sticky, distasteful residue.

It's easy to regulate the amount of smoke flavor by manipulating the amount of wood chunks and chips used during the cooking process. Most smoked meats will have more smoke flavor if refrigerated for a day before serving. Cooks not afraid of cholesterol might consider mixing small pieces of skin with chunked meat into salads for a double smoke punch.

The most difficult thing about smoke cooking is telling with accuracy when the meats are done. Most smokers come with instructions and a basic chart of cooking times, but wind, temperature and altitude can vary cooking times considerably. Gamebirds are done when the leg moves easily in the joint. An instant-read meat thermometer comes in handy, but if you don't have one, err on the side of safety. Cook your meats an hour or so longer than called for. Overcooking isn't a big problem on a smoker. Waiting for it to be done, while those good smells are wafting about, however, is a much bigger problem. ☒

# Sight Casting for Drum

Soon coppery schools of red drum will be moving at Ocracoke and Portsmouth, and the sharp-eyed angler may get in a lucky cast.

written and photographed by Joel Arrington ©1991

On a fresh spring morning, with the sun bright near the horizon and delicate terns hovering over bait, Ocracoke Inlet is an exciting place for any angler. Usually breezy, sometimes roiled by seas rolling in from the Atlantic, this cut through North Carolina's string of barrier islands continues to host some of the nation's last remaining giant red drum and the anglers who pursue them in boats.

Departing Ocracoke village's quaint harbor, the boater runs down the channel, Pamlico Sound to starboard, turning beside red steel buoys and gauging the seas ahead. He throttles back on the roller-coaster swells, clears the rough water and steers toward Portsmouth Beach. He and his crew will work south this morning and possibly regret it because fish might just as well show up on the north side instead.

If it's too early, the light will not be good for sub-surface visibility. If the water's calm enough, however, and the fish have the consideration to swim near the surface, the angler doesn't need to see into the water. A school of drum can make a characteristic wake an experienced spotter might see a long way in the right light.

Schools of migrating rays may temporarily fool even old hands. Stingrays flash the same shade of beige as drum, and when swimming just on the edge of visibility, they are easily mistaken for what you so earnestly want to see. But rays are a good sign for drum, most anglers say. When one ray school after another comes through, the fish spotter dismisses first one, then another until he may grow inclined to take them lightly. The next one could just as well turn into drum before his eyes and be under the boat and spooked before he can swear, much less make a cast.

The hunt is best pursued down-light, but sometimes you can see a wake better into a hazy sun. Back-lighting gives it texture. Experienced spotters take the tide, the wind, the light, the time of day and other factors into account. Cloudy days with wind more than about 15 mph almost prohibit sight-casting altogether. Only the best drum hunters succeed then. Early risers gain little because they just can't see much until the sun gets up. A period of two hours after high water can be most productive. If this tidal stage occurs on a fair April or May morning just as the sun climbs 20 degrees above the horizon, you stand a good chance to see fish in Ocracoke Inlet.

A high sighting position is much to be desired. Boats with bridges and towers find more fish. However, with the level of traffic nowadays, many anglers find fish by approaching other boats that have located them, so spotting ability is quite unnecessary.

Convention permits anyone to cast into a school of drum no matter who saw it first. However, courtesy demands a quiet and considerate approach and care not to position your boat between a hooked fish and the angler. One inexperienced customer on a chartered boat one year had so little drag set that his drum, perhaps a big fish, had taken at least 100 yards of line. When we accidentally ran over and cut his monofilament, he was livid, but the incident could have been avoided if he had been better advised about his drag setting.

Finding these fish, seeing them in the water and casting a lure to them remains for some anglers the apex of Southern salt water fishing. Where else in coastal waters can you approach a school of fish that might weigh 20 to over 60 pounds each, see them spread before you like a living carpet, cast an artificial lure and stand a good chance of catching one? Few locations remain even in North Carolina and Virginia, fewer still exist elsewhere in the nation.

Tackle for this fishing should be substantial. Most anglers will prefer a spinning reel, but if you can stand on a pitching deck and cast a revolving-spool reel without a backlash in an air of extreme excitement, by all means use one. It should have a high retrieve ratio, ideally 6:1. Most big spin reels, on the other hand, take up line fast enough. Be sure to use a large one with, ideally, a wide spool because they handle heavy line better than narrow-spool reels. Most sight-casters use 20- or 25-pound line on spin reels, and 25- or 30-pound on conventional reels. Experienced anglers

***Finding red drum** is not always easy, nor is getting a cast into a school without spooking the fish. Then, there always seems to be competition from other boats. But these obstacles only serve to make the reward for a successful stalk all the more satisfying. Stanley Winborne (left) and Capt. Norman Miller can attest to that.*

***A big red drum makes** a final lunge for freedom in Ocracoke Inlet where Micou Brown hooked it after making a long cast with a forged spoon to reach a distant school. Spinning tackle is the most practical gear for this kind of fishing, but patient, and lucky, anglers have also caught drum on flies.*

can enjoy somewhat lighter tackle without the threat of unnecessarily long battles that might spell doom for a released fish. Stout boat rods from 7 to 8 feet in length are about right. You can't see fish far away, so long casts are seldom necessary.

The most popular lure by a wide margin is the Hopkins slab spoon or squid. Some anglers like them to weigh 3 ounces; others prefer the 2½-ounce model. Some like a large single hook; others say it drags too often in the sandy bottom. I will tolerate occasional plowing to gain the easy removability of a big single hook. To handle fish easily around the boat, rig a 50-pound test mono leader about 5 feet in length.

Fly fishing is the ultimate challenge of giant red drum. You've got to get close and sink a fly quickly to have much chance. Once a drum is hooked, playing it on a fly-rod is no more difficult than playing it on other tackle. Getting one on is the trick. Just approaching a school while other anglers lay off and lob heavy metal lures is difficult. They resent the way you have to press the fish and generally let you know it. Fortunately it is sometimes possible for fly-fishing anglers to locate a school and get a few casts into it before the mob discovers what's up.

So few have tried fly-fishing for drum that the best techniques may still be subject to debate. Provisionally, I would suggest No. 11 or No. 12 systems, short leaders, sinking lines and weighted streamers. You don't need a No. 11 rod to play even a big drum, but in my opinion, you need it to cast the heavy flies necessary in the usually windy conditions you find. Expensive reels are a joy to fish but unnecessary for even the biggest red drum. A Martin N12D that lists for less than $100 has been more than adequate for me.

Most of my fly-fishing failures have been due to (1) an inability to find fish and (2) an inability to get a fly deep to a spooked school. If you are close enough to the school with a fly, chances are the fish will be in some degree of panic. Fortunately red drum will often take a lure even in headlong flight. You may have a window of 10 seconds during which you must cast and wait for the fly to sink. In this period the school must be close enough and in the right orientation to the boat and to the wind so that your fly can be cast at all. And, it must be delivered in time to sink deeply enough to reach fish near the bottom before they swim past or your boat drifts over them.

Admittedly I have run no objective test, but the best fly design I have seen is a Deep Clouser Minnow on a 5/0 hook with a pair of 1/10th-ounce lead eyes. Tied with a 5-inch shock of Fishair, it sinks acceptably and presents a big profile. However, no wimpy rod will cast this heavy fly. A No. 11 system and a full-sinking line delivers it reasonably well. Anglers should be sure before casting that they will not drift up on their line and should be careful to cast as accurately as possible. Pulling a sinking line out of the water for another cast requires patience and a deliberate pace. Both because of its sink rate and its ability to cut through wind, I think a sinking line is a good choice. A sink-tip line might be sufficient in some circumstances and even a floating line would work well in ideal conditions.

If you can fish 30 days a year, you stand a good chance to hit a day when everything comes easily. If you have one weekend to try, of course you have to give it your best shot even in marginal conditions.

North Carolina drum fishing is at its best in spring and fall. For the bigger fish, at least, fall is better by far. However, for reasons I cannot fathom, sight fishing has been better in the spring, with only minor exceptions. I can think of no reason why.

When Europeans arrived in North America 400 years ago, they could catch red drum as far north as Massachusetts, down the Atlantic Coast to the Florida Keys and across the Gulf Coast to Mexico. By about

***More stringent size limits** along with a rapidly growing sportfishing ethic of catch-and-release are undoubtedly helping the survival of these older drum. Tift Mann releases this drum in Ocracoke Inlet after tagging it as part of a cooperative state research effort.*

1920, the range had begun to erode from the north. No commercial landings have been reported north of Chesapeake Bay since 1950. Now the northernmost sport fishing occurs, very rarely, in Maryland's sectors of Chesapeake Bay, while Virginia's fishing—once of great proportions—has been fading. During the first 30 years of Virginia's Salt Water Fishing Tournament, the state awarded an average 177 citations per year for red drum. From 1983 to 1987, the average had dropped to 55 per year. Since 1988, when Virginia began to award release citations, its annual awards for red drum have increased, but stocks may be no bigger.

Here in North Carolina, the Division of Marine Fisheries reported recreational landings down 73 percent between 1988 and 1990. Last August it declared North Carolina red drum "severely overfished" and raised the minimum size from 14 to 18 inches. At present, no fish below 18 inches may be kept, while five may be kept per day between 18 and 32 inches and only one larger than 32 inches may be kept per day. Since these regulations are subject to change, be sure to check before you go.

Despite declining catches generally, awards for the big fish have held up well in the N.C. Salt Water Fishing Tournament ever since it instituted a release citation in 1979. The reason, almost certainly, is because anglers in North Carolina, like those in Virginia, are catching the same fish more than once.

Fishermen who participate in the N.C. tournament have been increasingly willing to release their drum. The release percentage started at 5 percent in 1979 and now approaches 90 percent.

In the face of diminished landings, does North Carolina's harvest need further restriction? The Atlantic Coast Conservation Association, an angler's lobby, says "yes" and is behind a movement to prohibit the sale of red drum. Regulations being proposed for the federal zone (3 to 200 miles offshore) are also much tighter. Fortunately 1990 produced an outstanding hatch of red drum and small fish were everywhere in 1991. This year class, if properly protected, could carry N.C. fishermen into the next century. The outcome of regulatory processes remains uncertain, but one thing is beyond doubt: if we don't take better care of our drum stocks, we could lose one of the South's unique fisheries. ⊠

*Chemicals Causing Mink Declines?*

# Links Between Pollution and Mink Populations To Be Studied

*Written and Edited by Vic Venters*

LEONARD LEE RUE

***Minks Matters:*** *A new study being conducted in North Carolina, South Carolina and Georgia will examine the impact of chemical contaminants in the food chain.*

Like many predators at the top of their respective food chains, mink have suffered a decline in their Southeastern populations during the past several decades. While all the factors behind the declines are not known, the presence of PCBs, organo-chlorines and other chemical contaminants in the minks' watersheds throughout the region are thought to be playing major roles.

A new study being initiated in three states—North Carolina, South Carolina and Georgia—will examine these declines to quantify what role chemical contaminants may be playing in the declines. Mink can accumulate poisons in their bodies because they eat other organisms—fish, crayfish, mollusks—that are also contaminated. Previous research has suggested that these contaminants may cause reproductive problems in mink.

The study is being conducted through the Department of Environmental Toxicology at Clemson University and will be assisted by state game agencies in the Carolinas and Georgia. The study is considered important for two reasons: Once specific problems affecting mink are identified, then remedial steps can be taken to counter the population declines. Also, the same water-quality problems affecting mink have the potential to affect humans using the same water supplies. Because of their sensitivity, mink are excellent biological indicators of water quality.

The study will concentrate on mink populations in the Coastal Plain of the three states where population declines have been most noticeable. Watersheds where mink declines have occurred will be monitored for contaminants in the water, in sediments and in fish and other organisms. Mink carcasses provided by trappers are currently being monitored from each of the watersheds being studied. "Right now, we're in the process of analyzing tissues from mink in all three states for specific contaminants," said Sharon Osowski, a graduate student at Clemson University who will be heading the project.

During the next year the researchers are planning to establish captive mink colonies on selected watersheds. "The mink in these captive colonies will be fed food and water taken from watersheds to determine what effects the contaminants in the food and water may have on them," Osowski said. "There are so many variables with wild mink caught by trappers that it's very hard to isolate what may be affecting them. With captive mink, you can control the environment and isolate what contaminants are affecting the animal and how."

The fish and game agencies in each state will assist the project and will be responsible for obtaining food and water for the captive mink. The N.C. Wildlife Resources Commission will become more actively involved when the colonies are set up. "This is an important study," said Perry Sumner, the N.C. Wildlife Resources Commission biologist specializing in fur-bearing animals. "Mink are a good indicator species. The same kinds of problems affecting mink could also be worries for humans eating contaminated fish."

*Results Will Help Policy Makers*

## Survey Examines Landowner Attitudes Toward Wildlife

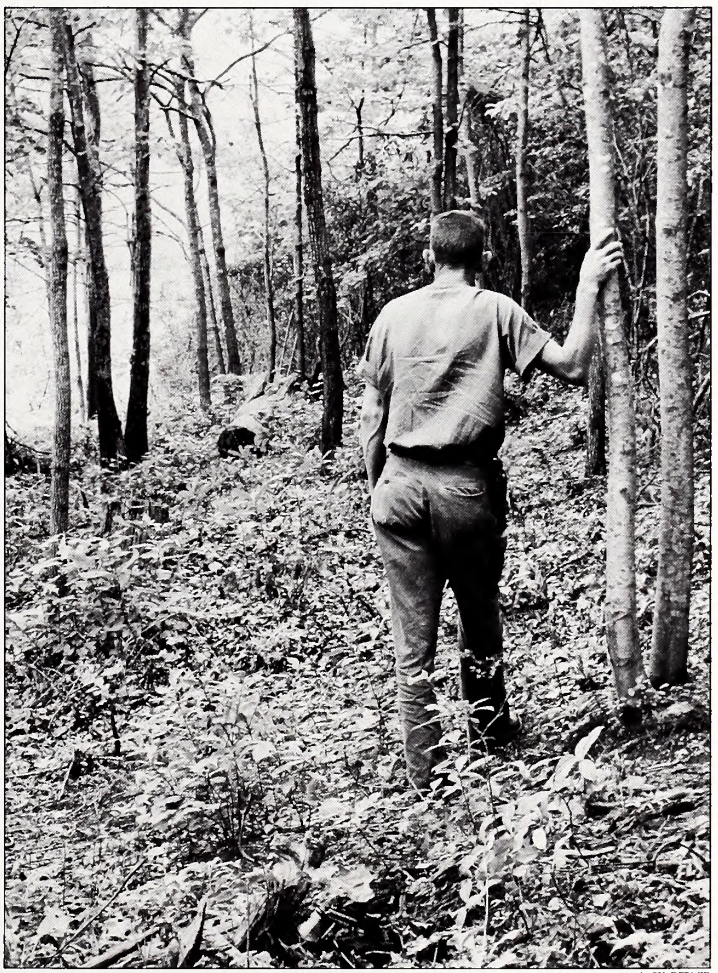
Researchers at N.C. State University are planning a major study that will examine North Carolina landowners and their attitudes toward wildlife management practices on their land. The group hopes to sample about 600 landowners by phone survey to obtain a statistically valid cross section of attitudes from various types of landowners in the state. The survey will be conducted by an interdisciplinary team of scholars at N.C. State University including members of the agriculture, forestry, zoology and sociology departments. The study is being funded by the N.C. Wildlife Federation, the state's largest conservation organization.

Learning landowner attitudes toward wildlife management is important because about 80 percent of North Carolina is privately owned. This leaves the future of our wildlife and environment—and attendant sports like hunting—largely in the hands of individuals. "No matter how effectively publicly owned land is managed, the fate of our natural resources, from wildlife habitat to water quality, will depend on what happens on private lands," said Dr. Jim Rice, a NCSU zoology professor and board member for the N.C. Wildlife Federation. "Like it or not, the voluntary choices and actions of private landowners form the backbone of our state's wildlife and natural resource management policies."

By surveying currently held attitudes, the survey will inform policy makers about what wildlife management and conservation practices are, or what these could be. Also, the survey will reveal whether these practices are popular or unpopular, effective or ineffective. It will also help policy makers formulate programs, laws and regulations that have landowner support. It will also illuminate areas where increased education efforts need to be directed.

"The survey will provide valuable guidance to all the various agencies and organizations around the state involved in developing educational programs, formulating public policy, designing research and promoting sound fisheries, wildlife and natural resource management," Rice said. "The survey alone will not bring about the changes we strive for, but it will give us a clearer view of what needs to be done, and how to best do it so that our efforts will produce concrete results."

The study will be led by Dr. Tom Hoban, a sociologist at NCSU, and an advisory committee will include representatives from the N.C. Wildlife Federation, the N.C. Wildlife Resources Commission, the N.C. Cooperative Extension Service and other agencies.



JACK DERMID

***Thoughts for Wildlife:*** *A new survey conducted by researchers from N.C. State University will examine landowner attitudes about wildlife management practices on their land. Measuring these attitudes will help policy makers formulate effective strategies for helping wildlife on private lands.*

*Others Involved in Research*

## Turtle Study Collaborative Project

Dear Editor:

The article "Juvenile, Adult Turtles Important to Populations" in the September issue of *Wildlife in North Carolina* may have given a misleading impression that I was primarily responsible for the loggerhead model and the 20 years of data on which it was based. My collaborators on the model were Debbie Crouse (currently at Center for Marine Conservation, Washington, DC) and Hal Caswell (Woods Hole Oceanographic Institution).

The original model was developed as a part of Debbie's doctoral dissertation at University of Wisconsin. The data were based on a long-term study at Little Cumberland Island, Georgia, conducted by Jim Richardson (University of Georgia) and analyzed statistically by Nat Frazer (Mercer University).

We hope that our message regarding the relative importance of large juvenile and sub-adult survival to the future of loggerhead populations was clear. Debbie Crouse and I are continuing to pursue models on the potential effects of TED regulations on sea turtle populations in the Southeast and to extend the modeling approach to other species and locations.

*Larry B. Crowder*
*Professor of Zoology*
*North Carolina State University*

*Includes Range Maps*

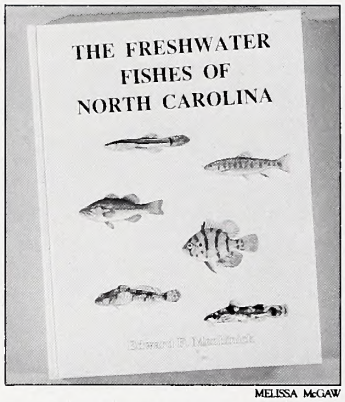
## N.C. Freshwater Fish Identification Book Available

After 22 years in the making, a definitive book on the identification and distribution of North Carolina's freshwater fishes is now available. Written by Dr. Edward F. Menhinick, professor of biology at the University of North Carolina at Charlotte, *The Freshwater Fishes of North Carolina* details the identification and distribution of the 220 species currently found in the state. Also included are the eight species thought to have been lost or extirpated from our waters, 16 species that may occur in North Carolina based on their proximity in neighboring states, and four marine species that belong to the same genus as freshwater species. The book was published by the N.C. Wildlife Resources Commission.

Prior to the publication of this book, there was no single comprehensive guide to the state's fishes. "I began work with North Carolina fishes in 1966 when I could not find a book to identify the fishes from a collection made near the UNC-C campus by my ecology class," Menhinick said. "This book addresses that need." Menhinick has been with UNC-C from 1965 to the present.

Menhinick's book provides accurate illustrations and range maps, and detailed identification keys for each species. Fish are keyed to family, genus and species. Both popular and scientific names are provided. Also included are notes on how to preserve fish for scientific purposes.

The book has already met with acclaim from biologists and natural scientists. Tim Mead, a free-lance outdoor writer, called it the "finest book of its kind that I have seen." The book should prove useful to a wide variety of users, from librarians to avid fishermen to college students taking fisheries courses and school-age students working on science fair projects. Industries that use water resources and environmental engineering firms should also find the book helpful.




MELISSA McGAW

***Fish Finder:*** *The new book,* The Freshwater Fishes of North Carolina, *is the first complete guide to the identification and range of all freshwater fishes found in the state.*

During the two decades Menhinick researched and worked on the book, 13 new species were discovered in the state, with Menhinick discovering or making initial identification on about half of them. Researching the book also involved making over 1,500 field collections of fish in all regions of the state.

Copies of *The Freshwater Fishes of North Carolina* are available directly from Menhinick or from Larkin Distributors (8924 Nottoway Drive, Charlotte, NC 28213). Single copies are $39 including state tax, postage and handling. If ordering more than one copy, discounts are available, depending on the quantity ordered. Two copies, for instance, would be $36 each, inclusive. For more information or to obtain a copy, write Dr. Edward F. Menhinick, Department of Biology, University of North Carolina-Charlotte, Charlotte, NC 28223, or call (704) 547-4046.

## Field Notes

| | |
|---|---|
| Eastern Gun Deer | Closes Jan. 1 |
| Central Gun Deer | Closes Jan. 1 |
| Black Bear | See *Regulations Digest* |
| Wild Boar | See *Regulations Digest* |
| Squirrel | Through Jan. 31 |
| Fox Squirrel | See *Regulations Digest* |
| Bobwhite Quail | Through Feb. 29 |
| Ruffed Grouse | Through Feb. 29 |
| Woodcock | Closes Jan. 18 |
| Raccoon and Opossum | See *Regulations Digest* |
| Common Snipe | Through Feb. 28 |
| Mourning Dove | Closes Jan. 11 |
| Crows | See *Regulations Digest* |
| Ducks, Mergansers and Coots | Closes Jan. 4 |
| Sea Duck | Closes Jan. 15 |
| Snow and Blue Goose | Through Feb. 10 |
| Brant | Closes Jan. 18 |
| Swan (by permit only) | Closes Jan. 31 |

Information on bag limits, either-sex hunts and other regulations may be found in the *1991-92 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest*. For a copy, check with license agents or contact the N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27604-1188.

*Booklets Available in Quantity*

## Sportsman's Conservation Role Promoted

As the sport of hunting comes under increasing fire from anti-hunting groups, getting the message across about the sportsman's positive role in conservation becomes ever more important.

To do this, hunting or fishing clubs may want to consider ordering bulk quantities of the booklet *The Hunter and Conservation* from the National Shooting Sports Foundation. In an easily understood and illustrated format, the booklet describes how American sportsmen helped found the modern conservation movement and how funds derived from taxes and license fees work for wildlife conservation today. These educational booklets are excellent tools to help educate and inform the non-hunting public.

The National Shooting Sports Foundation is making the booklets available in bulk at 40 percent discount prices. Prices start at $17.50 per 100 booklets or $150 per 1,000 booklets. If ordered in quantities over 10,000, your club's name will be printed free on the booklet. For more information, contact the National Shooting Sports Foundation, 555 Danbury Road, Wilton, Connecticut 06897, or call (203) 762-1320.

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before traveling to an event. Listings for the calendar should be sent in at least four months in advance.

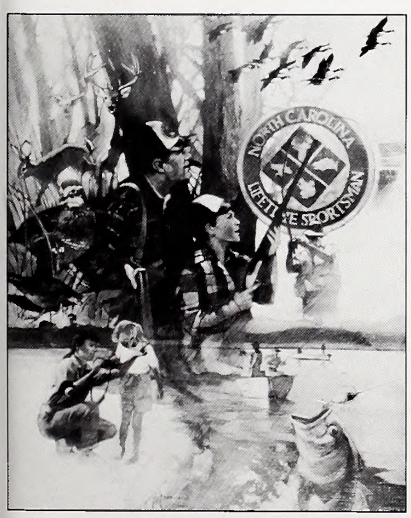
**Opening Jan. 18**

The Nature Science Center in Winston-Salem will sponsor an exhibition of 16 robotic dinosaurs and Ice Age mammals. Exhibit to be held at Hanes Mall in Winston-Salem with attendant museum exhibits suitable for school and public programs. Exhibit will run through May 10 and will feature near-life size robotic replicas of extinct mammals such as the sabre-tooth tiger and mammoth, as well as dinosaurs like *Tyrannosaurus* and *Triceratops*. For more information, contact the Nature Science Center at (919) 767-6730.

**Feb. 8-9**

The Coastal Carolina Wildlife Exposition will be held in the Coastline Convention Center in Wilmington and will feature wildlife paintings, carvings and sculpture. Also featured will be special events and displays by conservation organizations. For more information, contact the sponsors at the Greater Wilmington Chamber of Commerce, 505 Nutt Street-Ste, A-Bldg. B, Wilmington, N.C. 28401, or call (919) 762-2611.

## Wildlife Endowment Fund Report




**March 31, 1991**

Principal Balance
$16,323,262.37

Interest Earned
$8,343,293.27

Total Receipts
$24,666,555.64

Interest Used
$3,282,016.448

Fund Balance
$21,384,539.16

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

## The 1992 North Carolina Wildlife Calendar Is Here!

***With such artwork** as Joe Seme's "Hudsons" featured above, the North Carolina Wildlife Calendar is sure to sell out again this year.*

The works of Robert C. Flowers, Jr., Janet Allen Walker, David E. Doss, Patsy McAuley, Bob Henley, Bob Herr, Duane Raver, Larry Barton, Walt Obman, James A. Brooks, Joe Seme, and Bob Timberlake are featured in the 1992 Wildlife Calendar. Order yours today by returning the form below with your check or money order to 1992 Calendar, N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, NC 27604-1188.

### ORDER TODAY!

Please send me ..... N.C. Wildlife Calendars at $6.00 each $_____
All N.C. residents add $.36 sales tax per calendar _____
No sales tax for out of state residents.
Enclosed is my check for ..... Total $_____
Please use deliverable UPS address.

Name _____
Address _____ Apt. # _____
City/State/Zip _____
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All orders must be prepaid. We do not bill. A $15.00 charge will be made on returned checks (N.C.G.S. 25-3-512).

**For fund raising and bulk rate information (10 calendars or more), call 919-733-7288. Please allow 6 weeks for delivery.**

CALO92

# Breeding Boxes and Bird Food

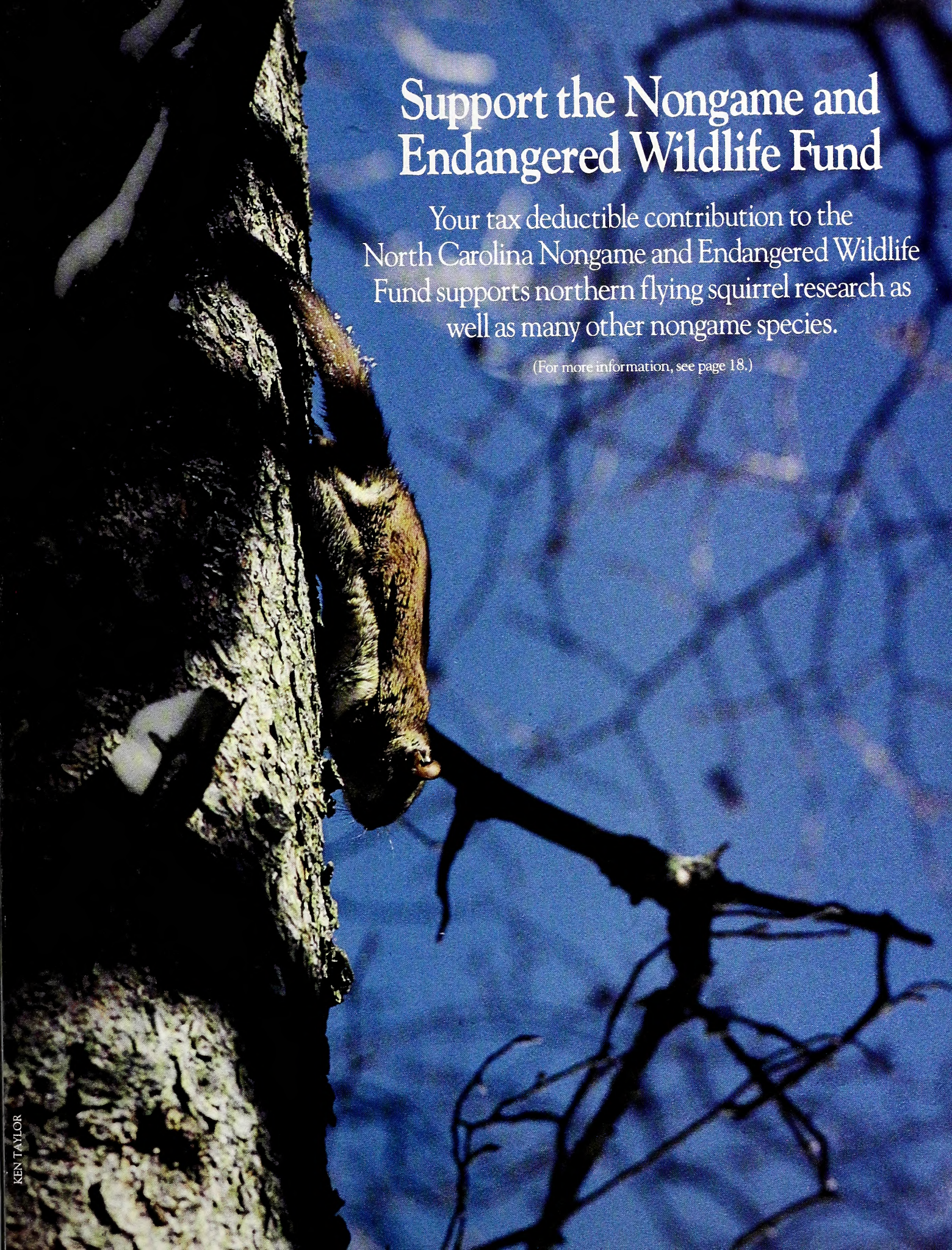
*by Vic Venters*

If it's really cold, your natural inclination will be to stay inside where it's warm and cozy. Animals don't have that luxury. There are some vital chores this month.

*Good Luck Duck Boxes:* Most people don't realize that wood ducks begin looking for nesting sites very early in the spring. If you're planning on putting up boxes, make sure you've got them sited and placed by the end of January. For your nesting box to be helpful, you must place predator guards below the box to foil raccoons and other climbing predators. A wood duck box that results in the death of the nesting hen as well as her young from predators is really worse than no box at all. You should also place fresh cedar shavings or sawdust in the box for the hen to build a nest in. In natural cavities in trees, the ducks use the powdery decayed wood dust. If you've got old boxes already up, check them this month and repair predator guards. Also, clean boxes of old nesting material, egg shells and wasp nests and place fresh nesting material in them.

*Savory Seeds:* All bird foods are not created equal, especially in late winter. Although cheap bird food is suitable for the warmer months when birds do not need as much protein to keep warm, use high-quality seeds during cold months like January. The best seeds for species like cardinals, chickadees and goldfinches are sunflower seeds, especially those with high oil content. Millet and safflower seeds are also excellent. Thistle seeds are an excellent—although relatively expensive—food for small bird species like finches and you'll need a special thistle seed tube feeder. Stay away from mixes using grains such as buckwheat, canary seed and cracked oats. These fillers are often not eaten and provide little nutrition.

*Cover Me:* As late winter robs the landscape of protective cover for small game, take a hard look at your food plots and answer these questions. Do they provide adequate late winter food? Are there other food sources available so that food plots aren't really necessary? Most important, is there adequate protective cover around your food plots so that feeding quail or other game can hide from predators? If you've got problems on this front, you'll need to improve your plots in the spring planting season by adding cover or altering food crops.

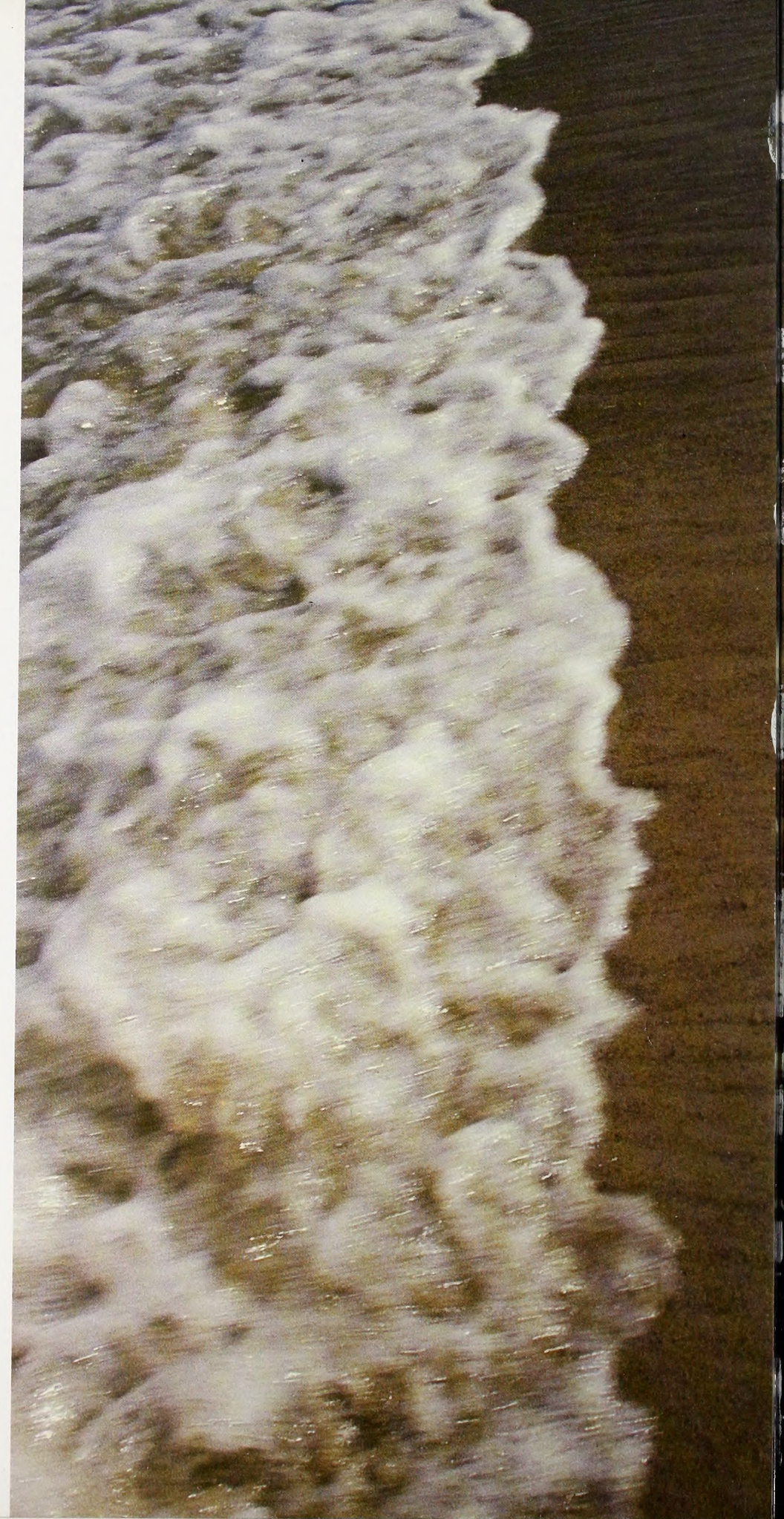


# Support the Nongame and Endangered Wildlife Fund

Your tax deductible contribution to the North Carolina Nongame and Endangered Wildlife Fund supports northern flying squirrel research as well as many other nongame species.

(For more information, see page 18.)

KEN TAYLOR



## Almost Home

Just a few more yards and this Atlantic green sea turtle will regain the relative safety of the ocean. Within two months, her young will hatch and make the same uncertain trip. Only a few will survive to become adults.

Second-class postage paid at
Raleigh, North Carolina

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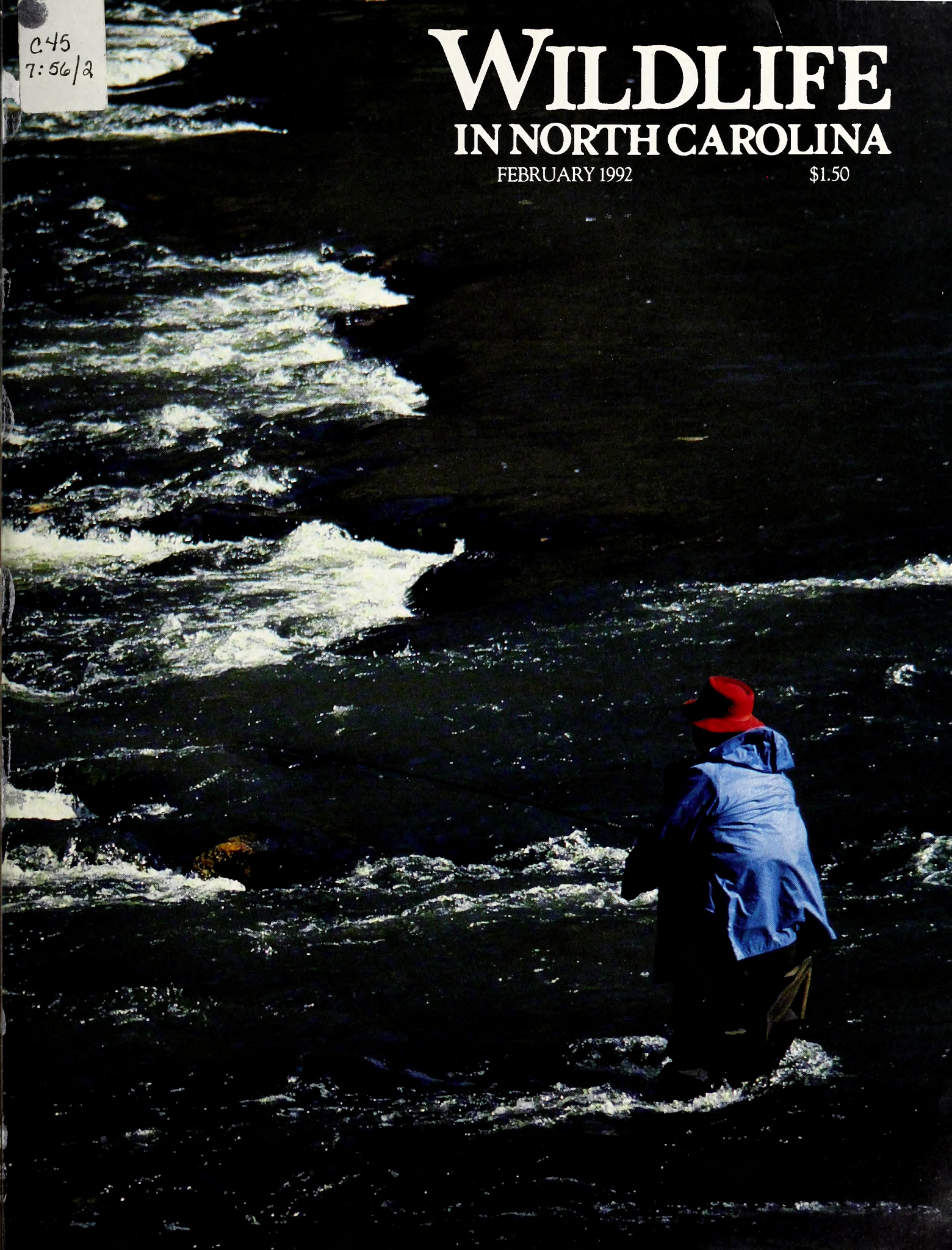
# WILDLIFE IN NORTH CAROLINA

FEBRUARY 1992 $1.50



# Mean Streets and Tough Critters

*by Jim Dean*

The sparrow was sitting in the middle of a downtown street taking advantage of a momentary lull in traffic. As I approached in my car, I expected to see the bird flit away at the last moment. That's the game these tough city birds seem to like to play.

But this sparrow never moved, and by the time I realized it was not going to fly, it was too late to stop or dodge. Must be sick or injured, I thought as I came to a near stop and looked back. The sparrow was still in the road, pecking away intently at something. I watched it for a few moments until it finished eating and flew away. That bird plainly didn't care that I had straddled it in a moving automobile.

LEONARD LEE RUE III

How did that sparrow resist the urge to fly as the car passed overhead? Was this a learned response, or had this bird simply been born unafraid into a world where automobiles are as much a part of its natural habitat as a tree or a fireplug? Had I seen a mutant "early bird" that would pass its survival adaptation to future offspring in one of those infrequent, evolutionary lurches, or had I merely seen a bold sparrow with "Adapt Or Die" tattooed on its shoulder?

The author of our popular on-going Nature's Ways series didn't seem surprised when I told him what I'd seen. "The way things are going," Larry Earley mused, "in another 1,000 years, street sparrows may be driving cars and we may be pecking in the road."

For many years, I have lived in an inner city neighborhood only a few minutes from Raleigh's downtown. An amazing wildlife population lives around me amidst lawn mowers, traffic, loud music, gangs of kids, dogs and hunting housecats.

Just next door, a raccoon waltzed through the cat door one day and muscled in to feed from the dish alongside the felines. Until steps were taken to keep it out, it quickly learned where the food bag was kept and would no doubt have been opening the refrigerator and making its own peanut butter and jelly sandwiches within a week. Another neighbor, who tired of what she thought was a marauding raccoon that kept raiding her garbage cans, borrowed traps from the city and wound up catching an entire family including kids, nieces, aunts and grandparents.

After coons learned to open the wire handles on the lid of my garbage can, I bought a more secure system. Now the unyielding lid has been so thoroughly chewed around the edges that it looks like a lace doily. These raccoons even leave me bones and scraps from other garbage cans. I think their intention is to guide me in my eating habits so that I will leave more desirable garbage.

Just this past week, a possum I encountered in my driveway asked me what the heck I thought I was doing coming home so late. Cottontails are having lawn parties up and down the street. Chipmunks have carved out interstate highways under the ivy, and moles have excavated a subway system throughout the backyard. Southern flying squirrels are practicing trapeze acts in the treetops, and there are so many gray squirrels hereabouts that they're having gang wars with blue jays, cardinals and myriad songbirds at the bird feeders. Even tiny, elusive mammals like shrews can occasionally be seen as they go about their customary business of eating many times their body weight in daily prey.

Other species I see occasionally include hawks, bats, skinks, toads and garter snakes. On summer nights when I leave the windows open, I often wake to a muted chorus of great horned and screech owls. And though they aren't in my immediate neighborhood, there are whitetailed deer, muskrats and beavers living within the city limits.

There is a simple explanation for this apparent wildlife explosion in our cities.These animals have been able to adapt to habitats they find in urban areas. Indeed, their landscape of concrete, roads, shopping centers and housing developments is the only habitat on earth that is actually increasing. Wetlands, tall grass prairies, old growth forests, rain forests, tundra, potholes, estuaries and myriad other priceless habitats are dwindling steadily—some may literally disappear within our lifetimes. Gone with them will be the countless plants and animals that lived there. Those animals can't simply move elsewhere. Gone, too, will be the benefits to weather, medicine and countless other resources we will someday wish we'd used more wisely.

Most of us love our neighborhood wildlife, of course, but their prosperity is not a sign that all is well.We may be living among the few animals that have a long-term future.

February, 1992
Volume 56, Number 2

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Health, and Natural Resources

William W. Cobey Jr. / Secretary

North Carolina Wildlife Resources Commission

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Wildlife Through the Year** *by Vic Venters*

**Cover** *A fisherman tries his luck for smallmouth bass on the New River in western North Carolina. Photograph by Joel Arrington.*

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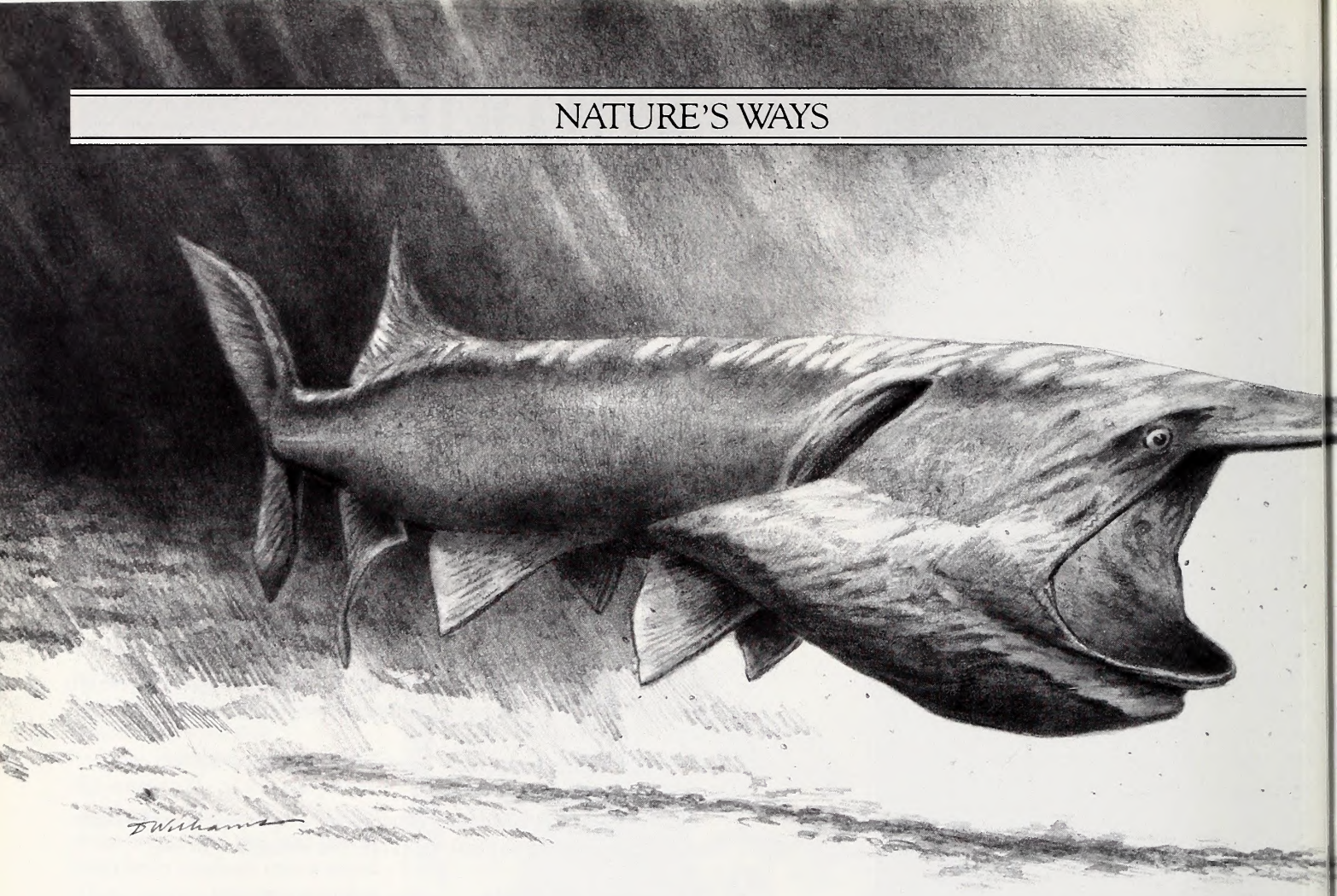


***The bizarre-looking paddlefish*** *resembles no other freshwater fish. Its long, flat snout is thought to stabilize the fish against the drag created when it swims with its mouth open. A filterfeeder, the paddlefish sifts the water for microscopic zooplankton such as daphnia, diatoms and rotifers (right).*

# Phantom Fish

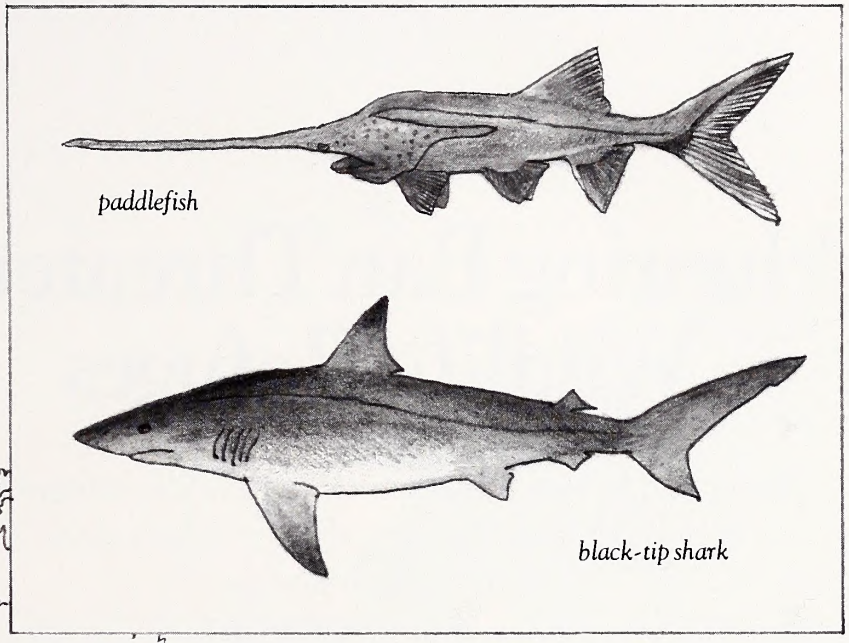
*written by Lawrence S. Earley*
*illustrated by David Williams*

It's little more than a legend now in North Carolina. The records are wispy—a single hundred-year-old scientific report of a specimen caught on the French Broad River. Yet, there's little doubt that paddlefish once occurred in North Carolina, even less doubt that it's one of North Carolina's most ancient and most bizarre animals.

Ancient because the paddlefish line arose perhaps as long as 400 million years ago, long before the dinosaurs and even before the evolution of such primitive fish species as the bowfin, the sturgeon (two of the paddlefish's nearest relatives) and the gar. Only two paddlefish species—one in North America and another in China—have survived out of the hundreds that once belonged to the paddlefish line.

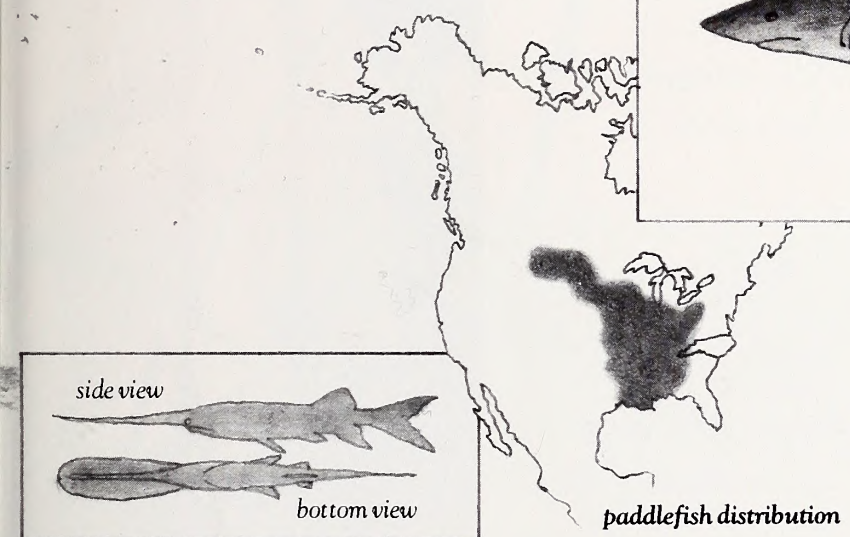
Bizarre? How else to describe a fish with a snout that's been compared to a spatula (its Latin name is *Polyodon spathula*), a beaver's tail and the blade of a canoe paddle? Two feet long, flat and rigid, the paddlefish's proboscis seems to remind observers of everything but itself because, well, nothing else in fresh water even remotely resembles the paddlefish.

Explanations of the purpose of this distinctive feature are various. Originally it was thought that the paddlefish used it to stir up its food from river mud, or that sensory organs in the snout detected concentrations of plankton. But according to more recent reports, the rigid structure stabilizes the fish against the drag that would occur when it opens its cavernous mouth.










**Two feet long,** *flat and rigid, the snout of the paddlefish has been compared to a beaver's tail and the blade of a canoe paddle. Today's paddlefish can weigh up to 100 pounds and be 5 feet long.*

**Once considered** *a freshwater shark, the paddlefish shares several features with sharks. It's both scaleless and boneless—like sharks, the paddlefish has cartilege rather than bones. Additionally, its vertebral column turns up into the caudal (tail) fin, a feature remarkably like that of the shark. The paddlefish is a strong swimmer, capable of making headway even against fast currents.*

Which it does nearly all the time as it feeds in the big midwestern rivers and lakes where its populations are concentrated. Instead of teeth, the paddlefish has gill rakers that strain small crustaceans and other plankton out of the water like whale baleen. It has a tough, scaleless hide and a boneless body stiffened by cartilege as do the sharks.

Being a plankton feeder, the paddlefish resists lures of all kinds, so for years the fish was ignored by anglers. But then it was discovered that you could catch a paddlefish by rigging up with giant salt water reels and 110-pound test line and snagging the fish with great treble hooks. So popular did this fishery become in Missouri that it has been partially blamed for the decline of the fish there. Also culpable were the huge catches of paddlefish taken earlier in the century by commercial fishermen lured by the high prices fetched by the fish's roe, or eggs. A large female might carry as many as 600,000 eggs. Yet perhaps most responsible for the decline of the paddlefish in the Midwest has been the loss of spawning habitat caused by the construction of dams and lakes. Dams have blocked the fish from their historic upstream migrations during spawning season, and they've caused the gravel beds needed by the paddlefish for spawning to be silted over.

The paddlefish's historic range lies in the Mississippi River Valley, the Gulf Slope and their tributaries. There were paddlefish in the Great Lakes, but they have been extirpated. In 1870, a paddlefish was reported to have ascended the French Broad River to Asheville, but there are no verified reports of its occurrence in the state since then. This may have been the only one of our westward-flowing rivers with a gradient gentle enough and the size to accommodate the fish on its spawning runs.

Only a phantom presence in North Carolina today, and listed as an endangered species on the state list, the paddlefish is truly one of our most remarkable fishes.

# Hunting Ban Threatens Wildlife Refuges

Originated by sportsmen, national wildlife refuges face a proposed ban on hunting that could threaten the entire refuge system.

written by Vic Venters
photographed by Ken Taylor

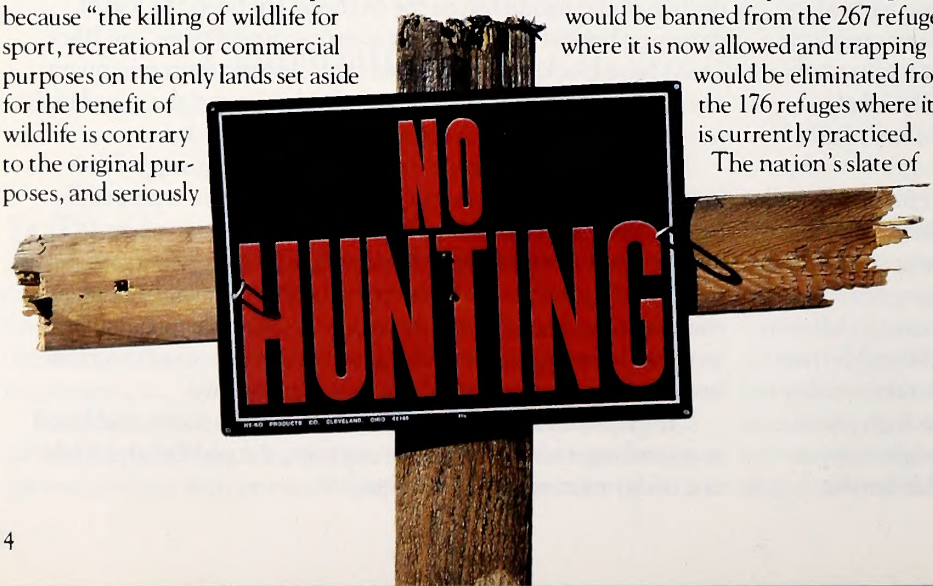
Their goal is simple: eliminate all hunting and trapping on federal wildlife refuges in the nation. To this purpose, various anti-hunting organizations are attacking traditional hunting and trapping uses on refuges on a number of fronts, most visibly through a proposed national law introduced to Congress by Rep. Bill Green (R) of New York.

Labeled by its proponents as the "Refuge Wildlife Protection Act," the Green Bill (H.R. 330) seeks to ban all sport hunting and trapping on wildlife refuges around the nation. The law is needed, its sponsors claim, because "the killing of wildlife for sport, recreational or commercial purposes on the only lands set aside for the benefit of wildlife is contrary to the original purposes, and seriously diminishes the integrity, of the National Wildlife Refuge System."

Essentially, the Green Bill seeks to make the refuges "inviolate sanctuaries" from hunters and trappers. The proposed law does allow the U.S. Fish and Wildlife Service, the federal agency managing the nation's 452 refuges, to kill animals for management purposes such as controlling deer overpopulation, although it makes the culling process very difficult. The proposed law already has 66 co-sponsors and has even attracted congressional support in North Carolina.

If the bill becomes law, sport hunting would be banned from the 267 refuges where it is now allowed and trapping would be eliminated from the 176 refuges where it is currently practiced.

The nation's slate of



***Is the sun setting*** *on the sport of hunting at federal wildlife refuges? It will if groups are successful in their attempts to ban all hunting and trapping on refuges. A hunting ban on refuges would be ironic since refuges were founded by sportsmen.*

# Hunting Ban Threatens Wildlife Refuges

public hunting lands would be wiped clean of about 85 million acres, including 77.5 million acres in Alaska. In North Carolina, hunters and trappers would lose access to about 45,000 acres of land on 8 refuges, including much of eastern North Carolina's finest public deer and turkey hunting grounds.

Unfortunately, banning hunting and trapping on refuges sounds fairly reasonable to many non-hunters who aren't necessarily anti-hunters. After all, don't many wildlife species need "inviolate sanctuaries?" Wildlife refuges only constitute 5 percent of the total land available for hunters, so the deletion of those lands wouldn't be missed, would it? And there are *some* instances where sport hunting and trapping can be a problem on refuges. For many, the question is legitimate: Are there any good reasons for allowing hunting and trapping on federal wildlife refuges?

Actually, there are plenty. First, the refuge system was founded by sportsmen and has been funded, in large part, by sportsmen. Contrary to the language of the Green Bill, hunting and trapping remain completely consistent with the original purposes of the refuge system. Furthermore, the arbitrary banning of hunting and trapping from *all* refuges would also have serious implications for managing wildlife—especially white-tailed deer—that tend to overpopulate and destroy their habitats when their numbers aren't controlled.

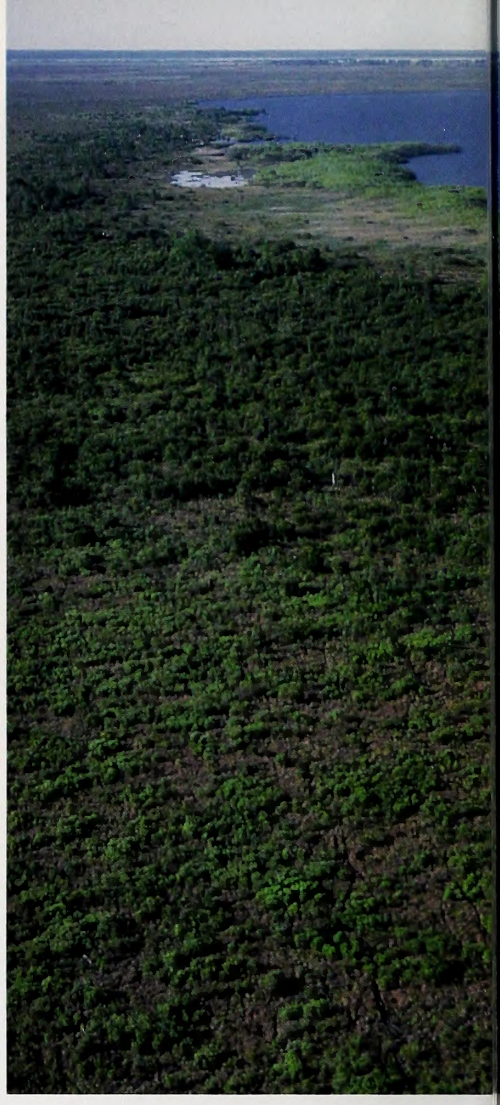
Most importantly, the proposed law could cripple future wildlife refuge acquisition efforts and destroy the credibility of the Fish and Wildlife Service—certainly in Southeastern states like North Carolina where the hunting tradition runs strong. A total ban of all hunting and trapping from refuges would create a powerful backlash from local residents in the Southeast that could derail attempts to create new refuges or add to them. Even the future of some endangered species such as the red wolf could be jeopardized.

***The first national wildlife refuge*** was founded by an avid hunter and conservationist—President Theodore Roosevelt—when he created the Pelican Island Reserve in Florida in 1903. By the end of his second term, Roosevelt had set aside another 86 areas as refuges.

Unlike national parks, many federal wildlife refuges were never designed to be inviolate sanctuaries from regulated sport hunting and trapping. Early on, they were designed as sanctuaries from uncontrolled *market hunting*. Later, many other refuges were specifically purchased for waterfowl production and protection. In the past decade, refuge acquisition has focused on the purchase of lands for endangered or rare species.

Beginning in 1934, sportsmen became the single largest source of funding for the refuges with the creation of the Duck Stamp. In the past 57 years, sportsmen have purchased over $350 million worth of Duck Stamps, funds specifically earmarked for wildlife refuge acquisition. That's been enough money to purchase about 4 million acres of the refuge system's 12 million acres in the lower 48 states—or about 33 percent. No other single refuge constituency can match these figures. The remaining 77.5 million acres in Alaska's vast refuges were created in 1980 by an act of Congress.

Currently, hunting is allowed on 267 of the nation's 452 refuges while trapping is allowed on 176. These activities are permitted only on small portions of the refuges, while the remainder serves as pure refuge. In many instances, hunting is tightly controlled by limited permits, restricted entry or hunting



***If the Green Bill** is passed, trapping would also be banned on federal refuges.*

***Through their purchases*** *of Duck Stamps, sportsmen have funded about 33 percent of all wildlife refuge acquisitions in the lower 48 states. Habitat saved by hunters is habitat saved for all wildlife. Deer hunting is allowed on the Pocosin Lakes Wildlife Refuge (above) in order to control crop depredation from burgeoning deer populations.*

***Although many wildlife*** *refuges were originally purchased for waterfowl protection and production, these productive wetlands also provide habitat for a wide variety of other species, such as this anhinga (below) photographed sunning itself.*

TIM BLACK

exclusion zones. On refuges purchased for waterfowl protection, for instance, no more than 40 percent of the refuge can be opened to waterfowl hunting by law and actual hunt areas are generally much smaller.

It is certainly not a case where roving bands of hunters are running rampant on all wildlife refuges. In North Carolina, for instance, a lottery drawing is held at Lake Mattamuskeet National Wildlife Refuge for a small number of permits each year, and the area actually open to hunting is only about 8 percent of refuge land. At the Pungo Unit on the newly formed Pocosin Lakes Refuge, another limited drawing is held for the deer hunts needed to manage the burgeoning deer population. Likewise, at the newly formed Roanoke River Refuge, managed jointly by the N.C. Wildlife Resources Commission and the Fish and Wildlife Service, drawings for permits are held for big game, small game and waterfowl hunts in designated areas only.

Public hunting is allowed on wildlife refuges for two reasons: wildlife management and recreation. The Fish and Wildlife Service regards hunting, trapping and fishing as "both acceptable, traditional forms of wildlife-oriented recreation and management tools to effectively manipulate wildlife population levels."

In some waterfowl production areas, for instance, trapping is sometimes used to control predators such as raccoons, skunks and opossums to increase waterfowl breeding success. On others, water rodents like nutria and muskrats—which can damage marsh habitat—are controlled through trapping. Most commonly, hunting is the only feasible management method to control large, free-ranging white-tailed deer populations. Without predation or population control measures, deer populations simply balloon beyond the carrying capacity of the habitat, suffering not only mass starvation but actually harming the habitat by overgrazing.

Interestingly, the Green Bill recognizes the biological need for controlling overpopulated wildlife by allowing culling. The language of the proposed law makes the process difficult and, because tax dollars might have to be spent hiring people to cull deer, it could be expensive, too. Moreover, the Green Bill ignores the obvious point that sportsmen can be used to manage wildlife populations both cost effectively and efficiently, and that they also pump about $28 million per year into local economies while using refuges.

***But there's more at stake*** than simply hunting as a wildlife management practice or for sport. The proponents of the Green Bill are extraordinarily naive if they overlook the enormous political backlash their bill would create if passed. In areas where the hunting tradition is strong—such as eastern North Carolina and other Southeastern states—and where wildlife refuges will be absorbing hunting grounds used by local residents for hundreds of years, an automatic ban on hunting would provoke outrage, as well as dry up funding sources and political support for additional refuge acquisition in the area.

As an example, we needn't look any further than the recently created 33,000-acre Roanoke River National Wildlife Refuge in Bertie, Martin and Halifax counties. Along with the ACE River basin in South Carolina, the lands of the Roanoke River Refuge repre-

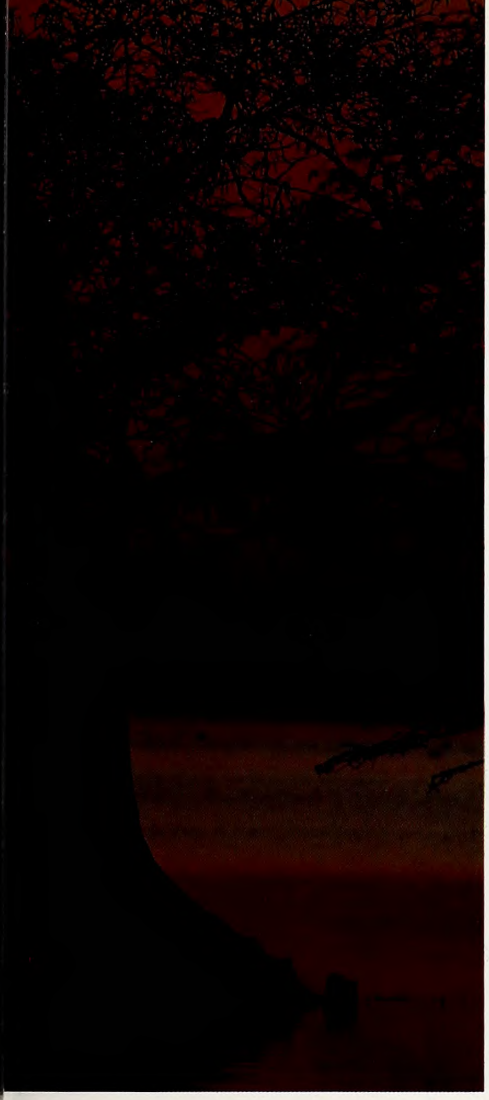
# Hunting Ban Threatens Wildlife Refuges

sent the finest and largest undisturbed bottomland hardwood ecosystem in the mid-Atlantic region. As superb habitat for wintering waterfowl populations of black ducks, mallards and wood ducks, the Roanoke bottomlands became a top priority of the Service for acquisition in North Carolina and vital for implementing the North American Waterfowl Management Plan, the international agreement designed to restore waterfowl populations. Biological surveys conducted by the state's Natural Heritage Program showed the area also supported an astounding variety of rare plant and animal communities. The bottomlands also provide spawning grounds for striped bass and some of the best deer and turkey habitat in the state.

However, when the refuge was initially proposed back in the late 1980s, it met with widespread opposition in eastern North Carolina, especially in Martin County. Not only did local officials fear a loss of economic potential and dislike a large federal presence in affected counties, but local hunters who belonged to old-time private hunting clubs in the Roanoke bottomlands complained of losing their exclusive hunting privileges in some of the state's best hunting lands. With significant grass-roots opposition in the east, North Carolina's elected officials were initially unable to grant required permission for the creation of the refuge.

That's where the hunting issue came into play. In order to ameliorate these concerns, the N.C. Nature Conservancy—the private conservation organization purchasing land for the refuge—proposed a complex land swap involving existing Wildlife Resource Commission game lands in Bertie County, where hunting was allowed, with proposed refuge lands in Martin County. Under the agreement, the federal government would take over the Bertie County game lands while the Wildlife Commission would manage Martin County lands. Central to the Memo-

***Had hunting been banned** on all federal refuges, the creation of the Roanoke River National Wildlife Refuge (right) would never have come about. A provision allowing hunting was central to a refuge creation agreement signed by Governor James Martin, the Wildlife Resources Commission and the U.S. Fish and Wildlife Service.*



***While productive waterfowl** and wildlife habitat at the Mattamuskeet Refuge is secure, continued habitat degradation makes new refuge acquisition all the more important. In North Carolina and other Southeastern states where the hunting tradition is strong, a hunting ban on refuges could hamper federal efforts to acquire more refuges in the region by creating a political backlash from local residents.*

randum of Understanding that created the refuge—signed by the Service, the Commission and Governor James Martin—was a clause that allowed hunting and fishing to continue on the refuge lands where it was compatible and biologically sound.

"If hunting had been banned on refuges, the Roanoke River Refuge would not have come about," said Grady Barnes, land management section leader for the N.C. Wildlife Resources Commission. "Everybody would have fought it, and there's no way the state would have allowed its establishment without that Memorandum of Understanding, of which continued hunting was a key part."

***Geese, ducks and swans** flood into the food-rich shallows of Mattamuskeet National Wildlife Refuge, an important waterfowl wintering area. Only 8 percent of the Mattamuskeet refuge is open to hunting and access is controlled through a limited number of permit-only hunts.*

Fred Annand, vice president of the N.C. Nature Conservancy agreed. "(A hunting ban) would certainly have had a negative impact on the creation of that particular refuge," he said. "A total ban on all hunting brings in all sorts of serious ramifications in the acquisition process."

Hunting for small game, big game and waterfowl is now allowed by a limited entry permit drawing in the Roanoke Refuge. "The sportsmen who draw a permit to hunt there now think that the refuge is the greatest thing that's ever happened," Barnes said. "It's a good quality area where you can see plenty of deer and few people. We've gotten more favorable comments on the hunts down there than anything we've ever done."

A ban on hunting would further undercut the trustworthiness of the federal government. "If hunting were banned on refuges, it would undermine the credibility of the entire refuge management system, not to mention the federal government," explained Warren Parker, the retired Fish and Wildlife Service administrator and biologist formerly in charge of the endangered red wolf recovery program. "In many instances, we've given our word to local people that traditional uses could continue. Banning them would lead to enormous distrust and would hurt refuge acquisition and expansion."

***The Green Bill also states*** that hunting inherently threatens endangered species on refuges. "National wildlife refuges are important to a wide variety of endangered, threatened or rare species and sport hunting and commercial or recreational trapping on the refuges results in unjustifiable death and injury to wildlife animals of these species."

It's not hard to refute this by looking at the Alligator River National Wildlife Refuge in Dare County. Consisting of 118,000 acres of deep swamp, scrub forest, brier-tangled pocosin, the refuge, acquired in 1984, is now home to the largest free-ranging population of endangered red wolves in the world and is the centerpiece of the Fish and Wildlife Service's attempt to restore this rarest of wolf species to the wild. It is also home to some of the nation's most liberal hunting regulations on wildlife refuges.

When the Fish and Wildlife Service began its attempt to reintroduce the wolves in North Carolina, it needed the support of sportsmen in Dare County for two reasons. First, widespread opposition from local residents—many of whom had traditionally hunted, trapped and fished on the lands that were to become the Alligator Refuge—would have KO'd the wolf project by creating intense political opposition. The Feds had already swallowed one bitter pill on this front, having had to retreat from an earlier attempt to place the wolves in the Land of the Lakes region near the Tennessee/Kentucky border

# Hunting Ban Threatens Wildlife Refuges

because the proposal was politically unpopular in the proposed release area.

Second, even if wolves had been placed on Alligator River in the face of widespread local opposition, a handful of disgruntled locals could have scuttled the red wolf program by illegally killing the animals.

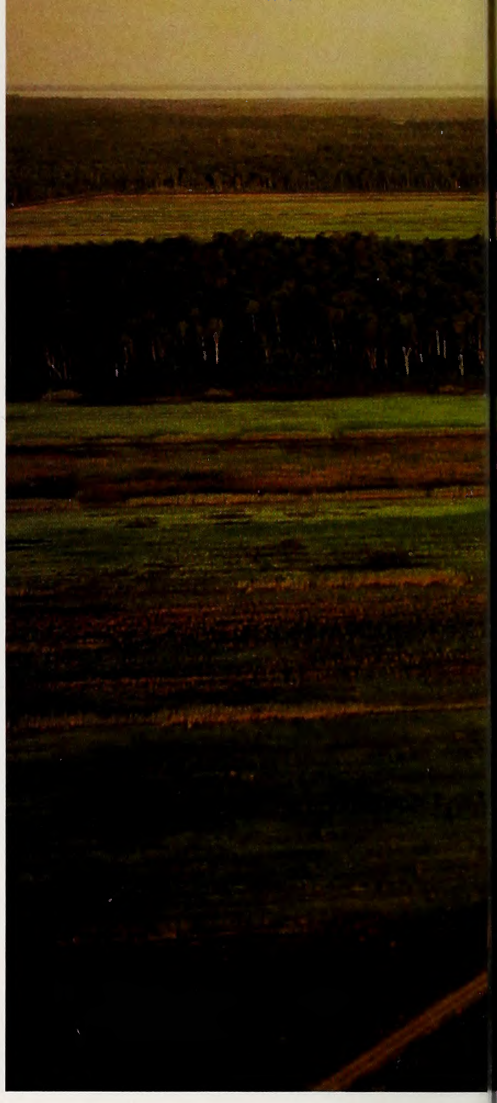
"From the very onset of the program, we assured residents that traditional uses would continue whether red wolves were introduced or not," Warren Parker explained. "Traditional public uses—including hunting and trapping—were promised." Parker, a hunter himself, worked hard to convince local residents that the Service could be trusted. And the Fish and Wildlife Service kept its word, allowing both deer hunting and trapping on sections of the new refuge. "Because of this, the deer hunters down there became our allies," Parker said.

"Without the support of the local sportsmen—be they hunters or trappers—this reintroduction program would not have worked," said Mike Phillips, the federal biologist now in charge of the red wolf reintroduction program at Alligator River. "We were dealing with such a small number of animals that it would have been quite possible for a couple of oddballs to blow the reintroduction effort out of the water by killing a few individual wolves. While there was some grumbling about the creation of the refuge, opposition wasn't and hasn't been directed against the wolf.

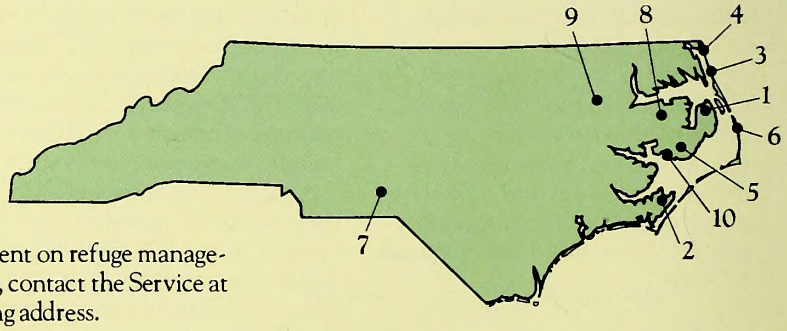
"Instead, sportsmen have reported seeing the wolves on at least 30 occasions while they were hunting—on and off the refuge—and I'm positive that they've seen them more than this," he added. "Those animals were not killed; instead, the individuals simply took the opportunity to observe one of the rarest mammals on earth and called us to report what they saw."

***The tolerance of sportsmen*** toward red wolves in eastern North Carolina stands in welcome contrast to the vehement opposition the federal government has met from ranchers in its attempt to restore gray wolves to Yellowstone National Park. Granted, the red wolf is smaller and a much less efficient predator of large animals than the gray wolf. But this case is also proving that hunters in the woods on a refuge do not lead to the "unjustifiable death" of even controversial species like the wolf.

At present, refuges are closed to hunting, trapping or fishing until an individual refuge manager recommends that they be opened. Technically, hunting and other uses are supposed to be allowed only if the activity is



# North Carolina's National Wildlife Refuges

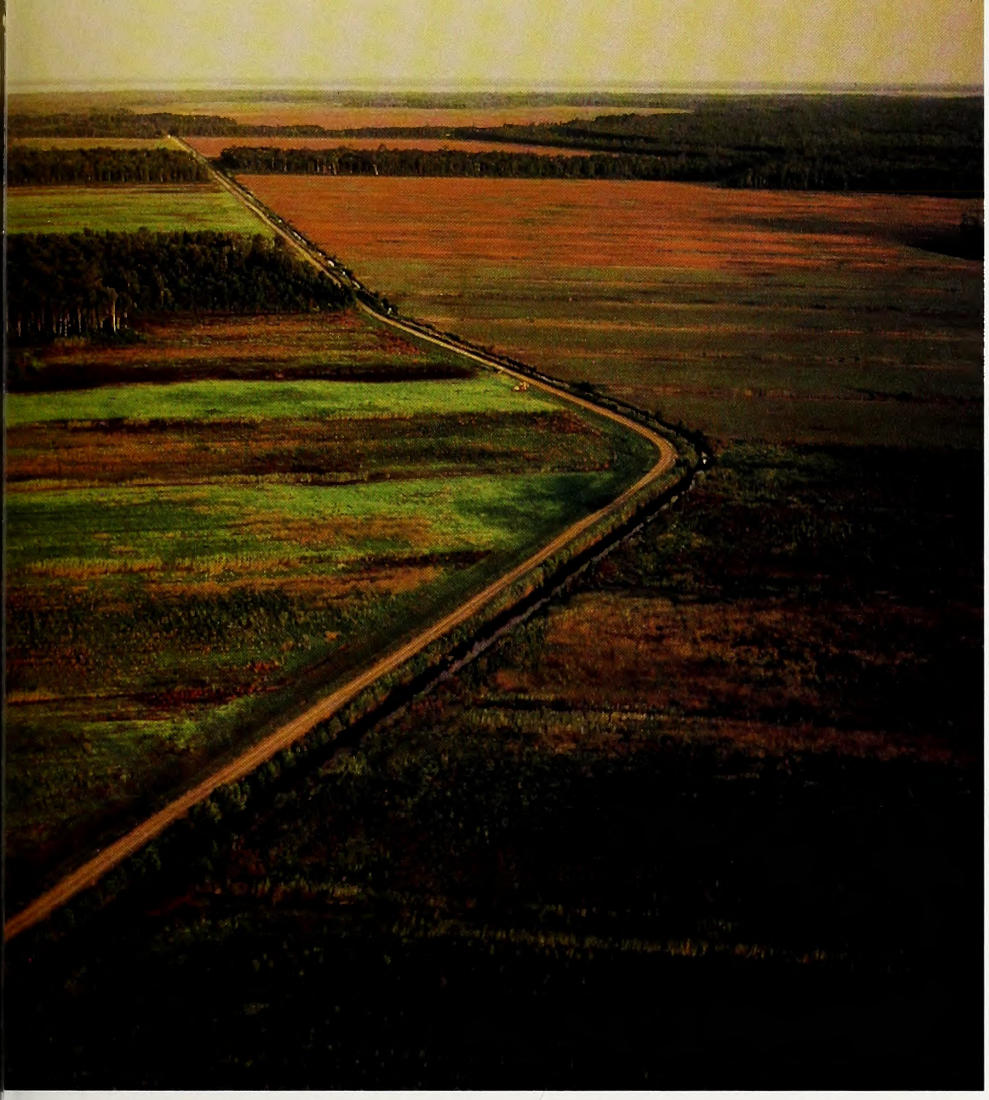



North Carolina's 10 refuges comprise over 500,000 acres of land. The U.S. Fish and Wildlife Service is scheduled to release a draft Environmental Impact Statement in April that will address potential management options—including the continuance of hunting, trapping and fishing—on federal wildlife refuges through the year 2003. The Service will actively be seeking public comment on the management alternatives presented in the EIS. After holding public hearings and receiving public comment this year, the Service will formulate a new management plan for wildlife refuges. Your comments regarding management decisions are important. For more information, or to comment on refuge management issues, contact the Service at the following address.

Refuges 2003 Planning Team
U.S. Dept of the Interior
Fish and Wildlife Service
Mail Stop-670 ARLSG
1849 C Street, NW
Washington, DC 20240

The Fish and Wildlife Service's Refuge 2003 Management Plan is not related to the Green Bill, although the anti-hunting elements of the Green Bill, if passed by Congress, would affect refuge management.

1) Alligator River NWR
2) Cedar Island NWR
3) Currituck NWR
4) Mackay Island NWR
5) Mattamuskeet NWR
6) Pea Island NWR
7) Pee Dee NWR
8) Pocosin Lakes NWR (includes old Pungo NWR lands)
9) Roanoke River NWR
10) Swanquarter NWR



**The 118,000-acre** *Alligator River National Wildlife Refuge in Dare County is home to the largest free-ranging population of endangered red wolves in the wild and is also open to deer hunting and trapping.*

"compatible" with the purpose for which the refuge was established.

In reality, however, this is not always true. There are some refuges where hunting and trapping are problems, most notably with waterfowl hunting. An internal Fish and Wildlife review found that waterfowl hunting was a problem at 32 of 202 refuges where it is allowed. On these 32 refuges, the problem is not so much refuge hunting per se, but adding hunting mortality to an already diminished waterfowl population.

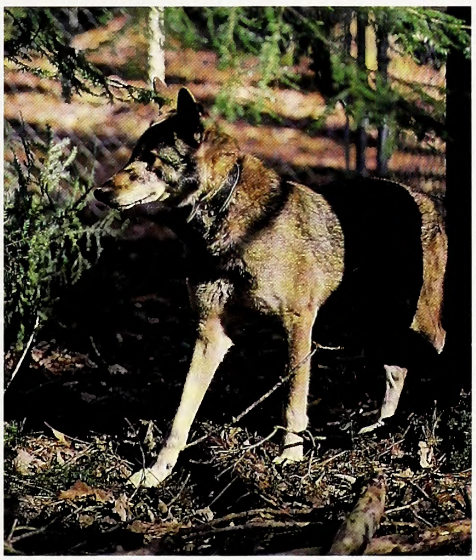
The anti-hunters have manipulated these figures to good measure, calling for the total ban on refuge hunting and trapping. What they do not mention is that on the remaining 170 refuges where waterfowl hunting occurs it is *not* regarded as a problem. There are only a minority of cases where small game and upland bird hunting on refuges is a problem. And the hunting of big game, often the most "reprehensible" practice in the eyes of the anti-hunters, doesn't even make the list.

There are also refuges where seemingly innocuous pastimes such as bird watching, hiking and wildlife photography are problems. These trouble spots on individual refuges are part of a larger crisis facing the entire National Wildlife Refuge System. Two reviews, one conducted by the General Accounting Office and another by the Service, showed that harmful uses are occurring on 63 percent of the nation's refuges. The most damaging activities, in order of importance, are military air exercises, oil and gas extraction, airboats, off-road vehicles, water-skiing, mining and grazing by livestock.

While a complete dissection of the problems facing the refuge system is beyond the scope of this article, the issue is a simple one: the Fish and Wildlife Service lacks the legal and political power to oppose non-compatible uses on many refuges.

To correct this, the Service is in the process of preparing a environmental impact statement and management reform plan (see "North Carolina's National Wildlife Refuges," p. 10) that, if implemented, could go a long way toward cleaning up abuses in the refuge system. There are also a number of proposed laws in front of Congress to reform the refuge system.

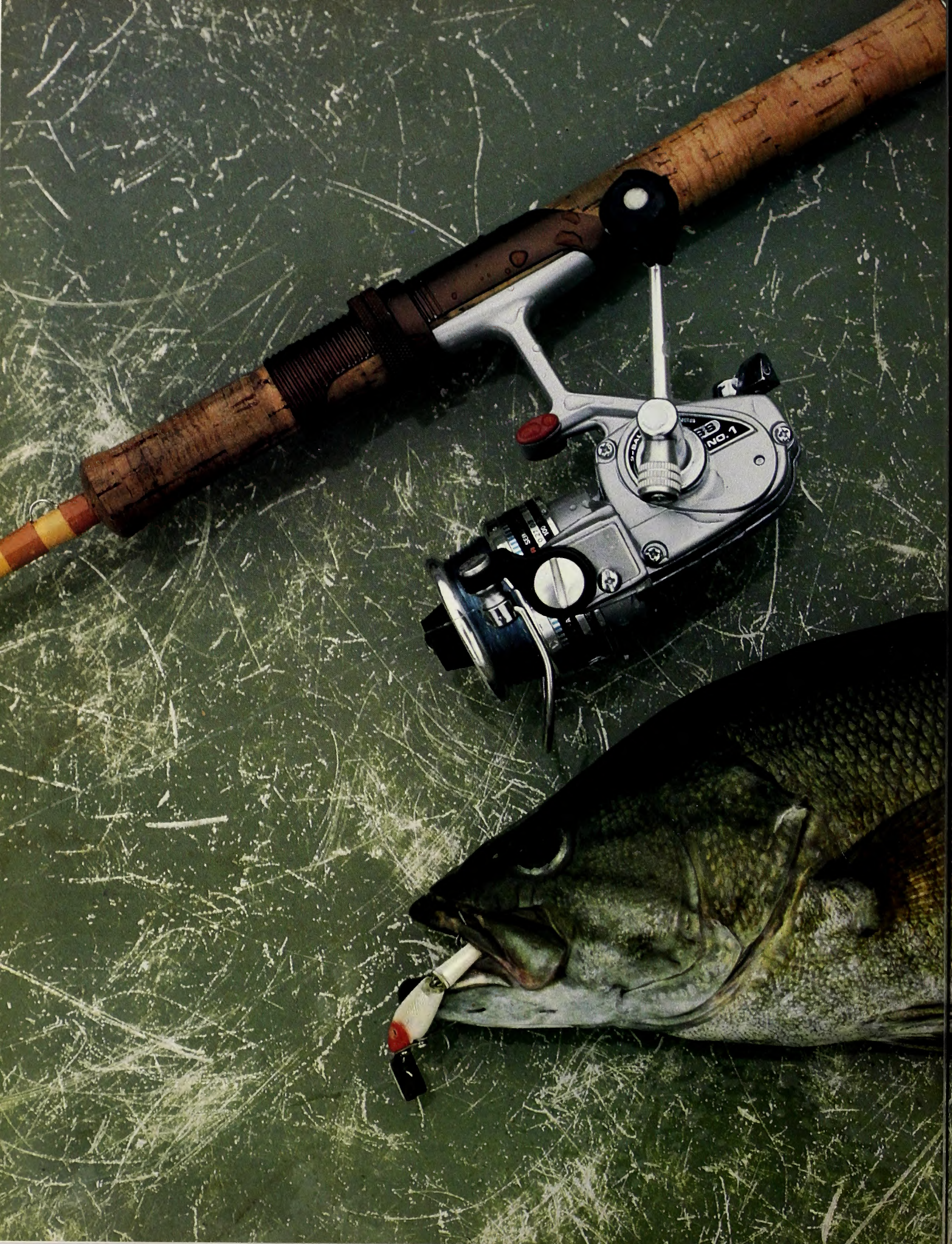
**In North Carolina,** *endangered species like this red wolf have been helped, not hurt, by hunters. Federal biologists in charge of red wolf reintroduction have enlisted the support of local hunters around the Alligator River National Wildlife Refuge, ensuring the project's success so far.*



Without question, where hunting is harmful or incompatible on individual refuges, it should be eliminated or reformed so that it is no longer a problem. And sportsmen should not press for hunting or trapping on refuges where they are harmful or incompatible. But needed refuge-specific remedies are a far cry from banning hunting and trapping on refuges altogether.

Sport hunting, when properly regulated, poses no threat to the biological health of any wildlife species—on or off wildlife refuges. No species in the United States has ever become endangered or threatened as a result of modern regulated hunting or trapping. Continued habitat destruction has been and remains the greatest threat to our continent's wildlife. Sportsmen have been a driving force in preserving habitat in America, not only through the creation and funding of wildlife refuges but through license fees and excise taxes—to the tune of $660 million per year in license fees alone.

With the Green Bill and similar anti-refuge hunting proposals, the axe has been raised not only over the sport of hunting but also over wildlife habitat acquisition efforts in the Southeast. It's up to sportsmen and non-hunting conservationists to work together—not merely for the future of the sporting tradition, but for the preservation of habitat for all wildlife, whether they are ducks, deer, red cockaded woodpeckers or red wolves. ⊠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# Jump Start for SMALLMOUTHS

Is very early spring the best time to catch a whopper smallmouth bass? That's what the experts say.

written and photographed by Joel Arrington ©1991

written and photographed by
Joel Arrington ©1991

The best stringer of smallmouth bass Bill Dance ever caught was on a summer night. He fished in 3 to 7 feet of water with free-falling bottom-bouncing spinnerbaits. Those 10 fish included one 3-pound largemouth bass and weighed 49 pounds. "I could not catch that 10th smallmouth to save my soul," Dance told me, shaking his head.

Despite that experience, however, Dance believes the best time to catch the biggest smallmouth bass in the South is from fall to early spring. Long regarded as one of the most successful smallmouth bass fishermen in the country, and well known for his television show, Bill Dance has fished throughout the species' range. He lives in the heart of prime Tennessee and northern Alabama smallmouth country, but his experience can be applied wherever the fish live. "There are more trophy smallmouth bass up North," he said, "because there is more smallmouth water and the fish live longer. Down here, bass grow faster, but they have a shorter life span."

Though North Carolina's smallmouths tend to run small in most waters, the state record is a 10-pound, 2-ounce bronzeback caught in Hiwassee Lake in 1953 by Archie Lampkin.

Most Tar Heel smallmouths live in rivers and impoundments primarily west of Winston-Salem and are widespread over the western third of the state where they provide a considerable fishery. Many experienced anglers admire them for their game qualities more than any fish. The species prefers moving water and a rocky bottom. Some of the biggest fish come from mountain reservoirs, like Santeetlah and Hiwassee, but some of the most interesting fishing occurs on rivers like the New and the Little Tennessee. Nearly all the angling in this state occurs between spring and fall, but Dance says the great majority of North

***Although the biggest*** *smallmouths are usually found in mountain lakes, cold-water rivers offer some of the best smallmouth fishing in the state. In winter, anglers can find the fish in deep holes out of the main current.*

Carolina anglers pass up the most productive months.

"From mid-November to mid-April, when water temperature is below 70 degrees is the best time," he says. "There's a period of two to three weeks in the fall when water temperatures are falling and forage fish are moving that you'll have some of your best chances."

Dance also likes early spring. "From mid-January to mid-March is always a good time," he says, "especially for about 10 days, but only when you fish the places where fish are going to spawn. Normally these banks are of mixed small chunk rock, pea gravel and possibly black shale mixed with red or tan clay—soil ideal for crawfish." Normally female fish will weigh about 10 percent more than usual at this time.

Dance believes smallmouth bass migration to spawning locations depends partly on moon phases, with the best period from the new moon to the first quarter and three days on each side of the full moon. The least desirable moon phase is the last quarter. Unfortunately, because of the weather, only a few days are likely to be fishable during this fall-to-spring period. An angler has to wait for a break and go quickly on short notice.

Prolonged warm rains in early spring will warm a lake dramatically. "Once the water temperature reaches the high 50s to low 60s," Dance says, "and the moon is in the proper phase, smallmouth bass are ready to spawn. They'll select banks with a slope. Look for the isolated stump or twig—they like to get against something."

Smallmouth will select areas that warm early. Dance says these locations will not be on the main part of the lake, but rather in the northern coves where they are protected from cold northern winds. Southerlies push warm water into northern coves where fish will spawn earlier and be more active than fish on the main part of the lake or reservoir.

Anglers catch most lake smallmouths in 15 feet of water or less around structures in the warm months, but most big smallmouths are taken in 25 to 40 feet in the cold months. Dance favors sloping, hard-bottom ledges spotted with stumps and other cover. For shallow fish he prefers an overcast day with an approaching front and falling pressure. For deeper fish, he likes overcast skies with stable pressure and calm to light chop on the water.

Live bait is without question the best choice for trophy smallmouths. Hellgram-

mites, crawfish and spring lizards remain good. "Where crawfish exist in good numbers," Dance says, "they might make up 75 percent of a smallmouth's diet from September to April." From April to September, the brown bass feed mostly on insects, shad and other small fish.

Lures that experienced smallmouth bass anglers find effective include minnow baits, crankbaits, jigs, jig-and-pork, jig-and-craw, the flippin' craw, grubs, small artificial worms (4-6 inches), spinnerbaits and vibrating lures. Probably the hair jig takes more lake smallmouths than any other lure. "Smallmouths live in clear-water environments," Dance says, "and are excellent sight-feeders."

Anglers must ask themselves if they are going for quantity or quality. "If it's numbers you want," Dance says, "use small lures. But if you're fishing for a big fish, use big lures." Big baits move more water and create more sound. "I want to present a different, bigger bait," Dance says, "not the same thing the fish are feeding on."

Dance likes to pick key lake areas and work them well. He advises anglers to "be picky about tackle," and recommends sharpening hooks and keeping good records. Most bass are lost to improper tackle, he points out, as well as to tight drag, light line, too little line, inexperience, overexcitement, and "rushing the situation."

"If you're catching small fish," he says, "fish deeper." Approach locations from the deep end, quietly. He suggests arranging fishing trips around the prime times, seasons and moon phases and, above all, to be motivated, have confidence and patience.

River fishing is quite different because moving water demands other skills. The fish array themselves in patterns according to season and water level. Though anglers use bait and lures with great success, many also use flies effectively on some rivers.

Chuck Kraft guides on Virginia's upper James River and on the New River not far downstream from where it heads into North Carolina. He begins in March, and finds the fish in their winter pattern in deep holes out of the main current, although not necessarily in the deepest holes. "The jig-and-pig is our main lure for big fish year around," he says. "It's easy to keep on the bottom and most anglers can fish it correctly."

By the first week of April, Kraft finds fish moving into a pre-spawn pattern in 1½- to 3-foot depths out of the current. "When water stabilizes at 56 degrees," he says, "smallmouth will spawn, the big fish first." Spawners move off the beds in May and the fish are hungry and aggressive.

When the water temperature reaches 71 to 72 F, smallmouths deploy in their summer pattern, spending more time in the shallow riffles. Here they find insects and minnows and a higher oxygen level. Fish will remain in the shallows until the fall transition in September, dropping back out of riffles to deep water by the time water reaches about 50 F in October.

*Bill Dance caught this nice smallmouth in warm weather. In early spring when it's still cold, fishermen can catch smallmouths using crawfish, hellgrammites and spring lizards at depths of 25 to 40 feet.*

At any time of the year, Kraft advises anglers to look for a change in the current where it slows behind a rock or where it accelerates. "Even a big fish can be in shallow water," he says. "Don't pass such spots." River smallmouths prefer the cover of heavy old wood and will tend to avoid new, thin and spindly cover. "Cast to every big, smooth log," he says. "Bass use such places as ambush points."

In addition to the jig-and-pig, Kraft recommends grubs and 3- to 5-inch tube jigs, and likes a 2/0 hook on a 1/16th- or 1/18th-ounce head for the tube jigs. "We also fish a lot of crankbaits in early spring when the water's off-color," he says. His favorites are Bomber A models, alphabet plugs and fat crankbaits. The best colors seem to be chartreuse fire tiger, chartreuse crawdad and brown crawdad with an orange belly. Another lure for off-color water is a buzzbait in ¼- and ⅜-ounce sizes.

In summer, he likes a 4- to 6-inch blue worm Carolina-rigged to spiral through the water. It's threaded on a 12- to 14-inch leader below a small black swivel and may employ a twist-on lead ahead of the swivel. He casts these worms and retrieves the swimming worm slowly along the bottom.

The special attraction of river smallmouth is the opportunity for fly-fishing. Usually it's best when water is low. The occasional dry spring makes for good fly-fishing in April, but usually the season runs from May or June into October, because rainfall is least in summer.

Kraft recommends nothing lighter than a 6-weight flyrod and line, but leans more toward 7- or 8-weight systems for casting big weighted flies. He's a believer in big flies for big fish. Leaders should run about 7½-feet in length. "Smallmouth fly-fishing is not a finesse thing," Kraft says, "it's just a question of delivering the fly. Line control is important."

It took me some years to learn to wait until I could feel a salt water fish on my leader before hauling back with the rod to set the hook. The screams of exuberant Florida guides still ring: "Don't strike until you've felt 'im." Once learned, this reflex is difficult to unlearn, but change you must if you're to hook many smallmouth bass. From a boat, you're drifting with the current and seldom have a straight, taut line. Fish tend to hook themselves on lines with a current-induced bow in them, as when the angler is wading, but drifting along requires an instantaneous sweep of the rod when your line stops.

In relatively calm water, you want to strip your line in at a good pace so that the fly is swimming hard in 12-inch or longer jumps. "You're half-stepping again," Kraft would say when I'd slow down.

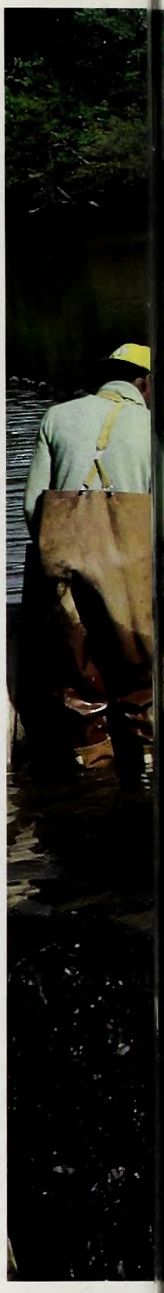
He likes flies that undulate and pulsate. On his streamers, he uses hackle feathers or marabou to achieve a breathing, swimming action. He cares little for bucktail or other stiff materials. His standard patterns include variations on wooly buggers and Clouser minnows. When dragonflies and damselflies hatch in summer, he likes ordinary No. 4 and No. 6 blue or green popping bugs with rubber legs. Fish will sometimes be in a feeding frenzy during these hatches in shallow riffles. Kraft sometimes has his clients fish a popping bug or slowly swim an olive wooly bugger across the current. "A big stonefly nymph also works well," he says.

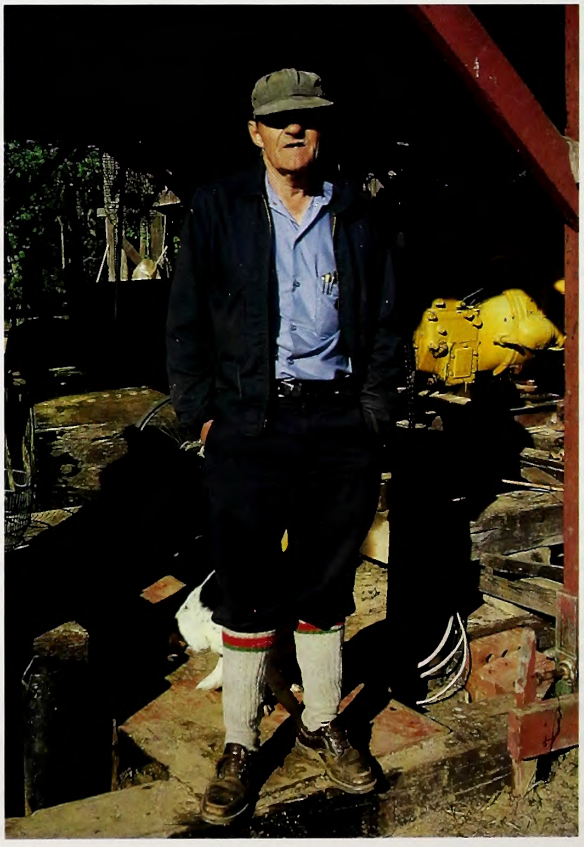
Whether you fish rivers or lakes, these tips from experts should increase your chances of hooking smallmouth bass. Once you get one on the end of your line, you'll quickly see what all the fuss is about. After all, it was the smallmouth—not the largemouth—that provoked Alexander Henshall to call these fish, "pound for pound, the gamest fish that swims." ⊡

# Black Water, Silver Fish

The vast herring runs have dwindled, leaving only picturesque remnants of a fishery that once heralded spring on blackwater rivers throughout the East.

written by Vic Venters / photographed by Frank Stephenson © 1991





**Williams Fishery** *was located below Murfreesboro on the Meherrin River at Hill's Ferry in Hertford County. The late George Williams was the owner and operator. "George was a very self-sufficient old country gentleman," said photographer Frank Stephenson. "He was one of the hardy souls who made a living off that river fishing, setting eel-pots and turtle traps when the herring weren't running. And he did make a living."*

*Williams Fishery was one of North Carolina's last remaining freshwater river or haul seines. The fishery closed in 1987. "A haul seine took a lot of labor," Stephenson said. "Maybe 10 men to operate. Of course, you could catch a lot of fish. In my lifetime, I've seen seines bring in 40,000 fish in a single haul. Now you'd be lucky to get 400. The fish are not there now to pay for operating a seine."*

The river folk knew what the old-time herring runs were like. Before fleets of Eastern Bloc trawlers flocked to our coast, rusty-hulled buzzards that scoured the Atlantic's depths until the picked-over scraps of the once great fishery were no longer worth the scrabble. Before the chemicals and pollutants sullied the spawning grounds in the rivers and streams. Before hardwood bottomlands and other water-cleansing wetlands fell to bulldozers and the bottom line. Before the dams and concrete slammed a door on a migratory instinct as old as the rivers themselves.

What the river folk knew is no more. The commercial herring fishery is dwindling and so, too, is a way of life. No longer do vast schools of herring flood from the Atlantic into Albemarle Sound in late February and early March.

Scientists today speak of the annual spawning migration of *Alosa sapidissima* in terms of reproductive instinct and seasonal hormonal changes, of temperature and salinity bands, of navigation to birthplace rivers by the longitude and latitude of the sun and the Earth's magnetic fields.

For the river folk, there were signs more easily discernable: dogwoods in full bloom, the moon full and plump in the early spring sky, Easter on the way. Are there any symbols in nature more ripe with fertility than these, brought to life by the millions of herring that would appear in rivers with names like Chowan and Meherrin, Pasquotank and Perquimans?

With their nets and juniper boats, the river folk waited for the herring to come home, the murky rivers of March to flash white and silver, the muffled *sp-laat* of herring breaking surface, the flapping sound of frenzied spawning drifting from the flooded hardwood swamp. They waited for the insistent tug of a net awash in the current, for the sting of a Nor'easter whipping round the river bend. For scales dried hard and silver on black rubber boots and the oily perfume of herring roe and flesh pungent in the March breeze.

The herring still come now, of course, but only in a trickle and not a torrent. A few pound nets are still set, a few fishermen still line the banks with bow nets in hand and hope in the heart. Laughter and the smell of herring frying still rise from riverside shanties. But of the big-run days, only pictures remain—two-dimensional snippets of a traditional lifestyle that sought rebirth each spring in the winter-weary rivers and lands of northeastern North Carolina.

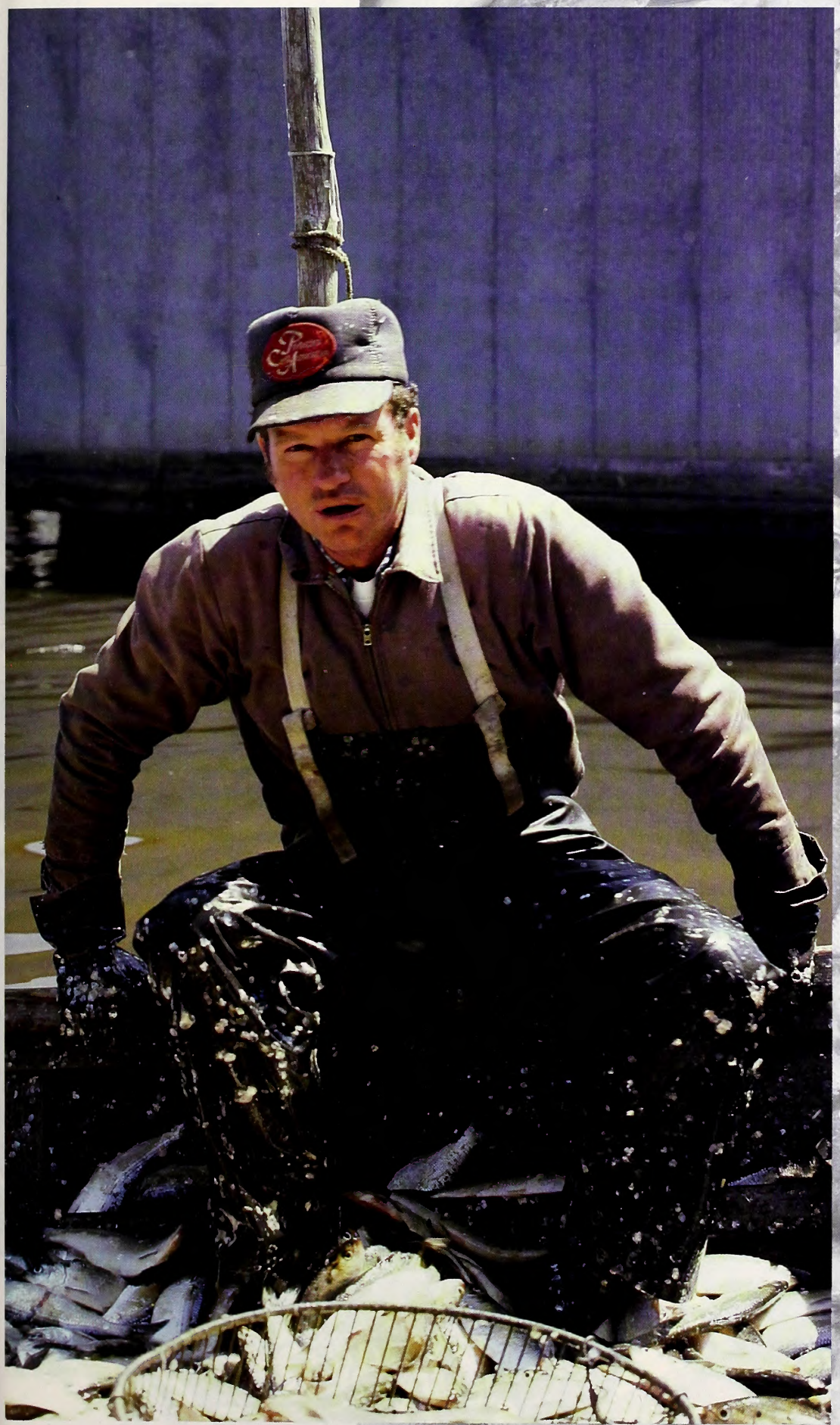
Photographer Frank Stephenson Jr. came of age on the banks of the Meherrin River in Hertford County. His family's roots are entwined with the herring fishery because many of his relatives operated and worked for herring fisheries in the region. "If you lived around here, you caught herring," Stephenson explained. "It was that simple. Everything pretty much stopped when the herring started running.

"I was raised on salt herrings," he added. "Growing up on a tenant farm, there were two things we could count on eating: sweet potatoes and salt herring." Stephenson still fishes for herring on the Meherrin every spring with a bow net and salts down his own supply each year. "There's nothing like catching a herring and there's nothing better than eating one. I'll catch herring till the day I die."

His photos are the culmination of two decades of photographing the herring fisheries along the Chowan and Meherrin rivers. ⊠

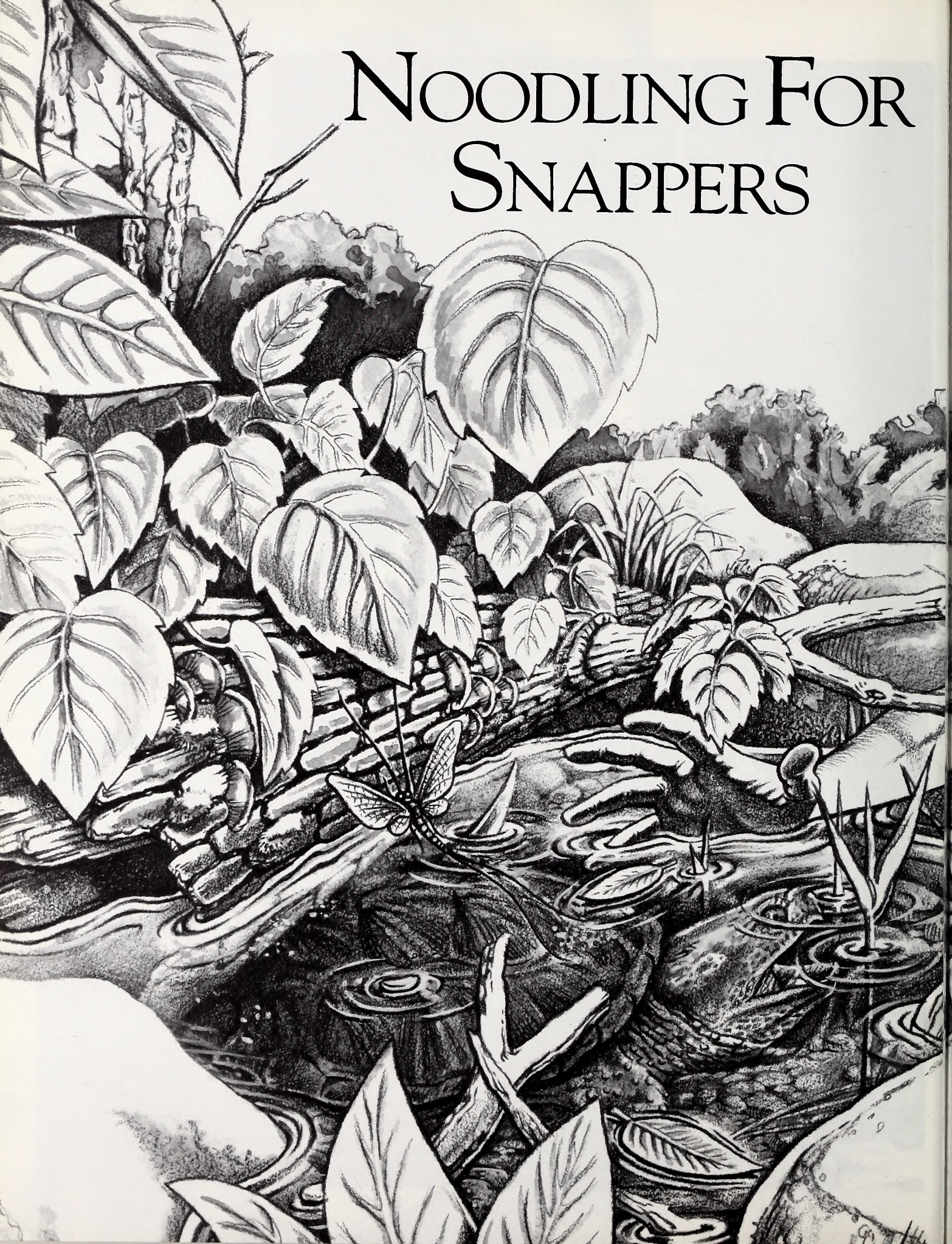
***Parker's Ferry Fishery*** *on the Meherrin is located at the ferry site, one of the last remaining river ferries on North Carolina. Established in 1942 and still in operation, Parker's Ferry Fishery uses pound or "Dutch" nets. Loretta Jenkins and Dennis Layton are the current owner-operators at Parker's Ferry. "They are super nice people," said Stephenson. "You got to be willing to get nasty, to be cold, to be hot, to put up with whatever the elements throw at you. And these two can handle it."*

*"The Dutch nets are set out on stakes," Stephenson explained. "At its peak, the Parker's Ferry Fishery probably used a dozen pound nets. Now, they've probably got two or three. In the old days, I've seen them get a boatload of herring out of one pound net. Now you can hardly get enough to fill a pan."*



**The day wasn't over** for this fisherman photographed at the Tunis Fishery on the Chowan River in Hertford County in 1980. There were fish to clean and pack, tangled nets to clear and patch, boats and motors to fix. The herring might have been taken to Perry-Wynns Fishery in Bertie County where the fillets would be salted or pickled, and the roe canned. "Herring roe is absolutely exquisite," Stephenson said. "We called it 'Meherrin River caviar.'"

# Noodling For Snappers



What sort of person would reach blindly under a river bank in murky water and yank a snapping turtle out by its tail? Not the author, for sure.

written by John Rucker ©1991 / illustrated by Jim Brown ©1991

For the last several years my friend Tonnie Davis of Climax, North Carolina, had mentioned turtle grabbing (also called "grabbling") as a sport I might enjoy watching and perhaps trying. Each time that Tonnie mentioned the sport, I had been repelled and fascinated by it at the same time. Finally, I asked him if I could go along as a spectator. A boy Tonnie knew, Jason, also indicated that he wanted to accompany the Davis brothers to see if he had the "right stuff" to make a noodler.

Tonnie had assured me, "If a turtle grabs your finger, let him hold it for a while. He'll turn loose. He won't bite very hard. You'll hurt yourself more if you snatch your hand away." It all sounded so simple. It had reminded me of some advice I had heard years ago regarding walking barefoot in eastern North Carolina where there are cottonmouths and diamond-backed rattlers. "If you step on a lawn hose full of water in tall grass," the advice had gone, "don't bother trying to jump up in the air. A snake would have already bitten you."

Tonnie had explained that the noodler or turtle grabber wades waist deep along the steep bank of a creek or river and feels around underwater along the shoreline for turtle dens where the snappers lie during the day. Usually the turtle den forms a little underwater cave under the bank where it lies with its nostrils just above the water line. The one "rule" that turtles are supposed to obey is that they usually lie with their tails toward the center of the river and their heads toward the bank. This "rule" makes noodlin' possible, for if many lay facing the noodler it certainly would not constitute a "reasonable" sport. Male risk-taking behavior, sometimes referred to as "testosterone poisoning" by exasperated mothers, is as old as *Homo sapiens*. Apparently at the very heart of the male personality is the need to test one's self to see how he measures up.

The North Carolina snappers are large, weighing up to 50 pounds and have jaws that are powerful and swift. They seem to enjoy their status as top predators of their food chain. To have an even more horrible predator feeling around for the snapper's tail in the murky water seems to particularly enrage the mossybacks.

The status of North Carolina's snapper population is excellent and turtles are repopulating creeks and rivers that for decades have been too polluted for wildlife. The snapper is a member of a truly ancient line, for turtles were contemporaries of the very earliest dinosaurs and were on the earth long before the first mammals. The turtle is not only one of the most venerable on earth in terms of its age, but also in its ability to inspire. The turtle played a prominent role in the creation mythology of hunter-gatherers across the world. The image of the turtle bearing the earth on its back is present in the mythologies of many cultures.

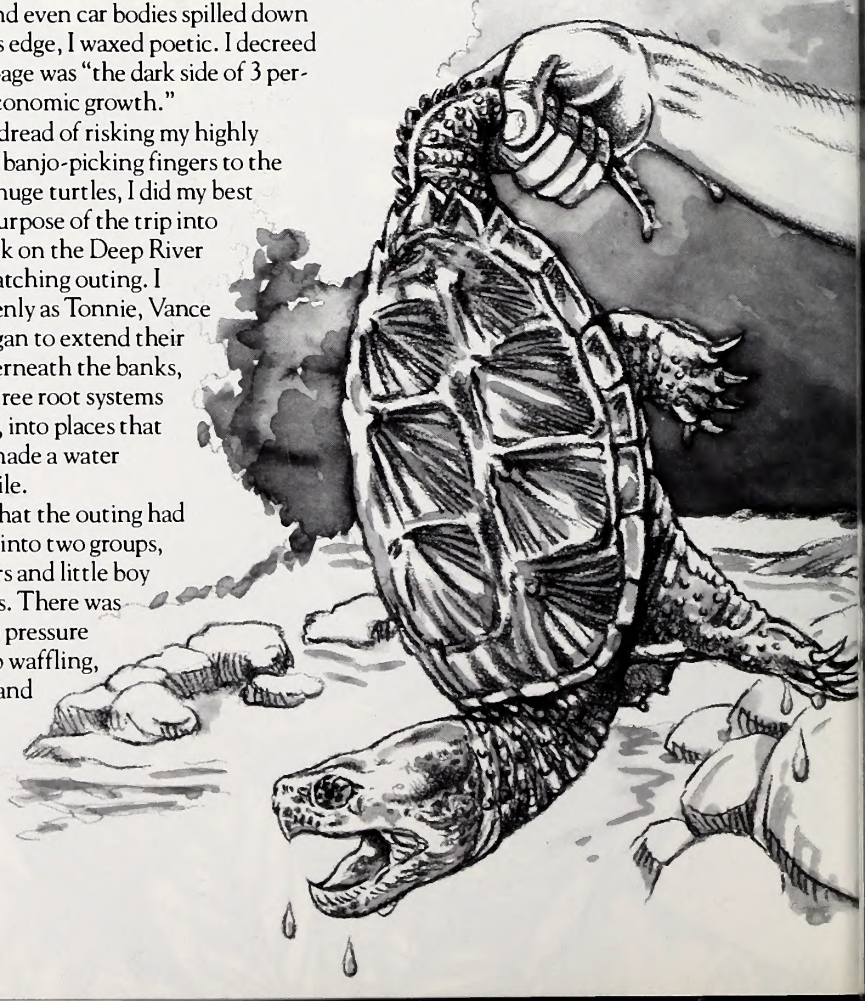
And so it seemed fitting that once again the turtle with its power to inspire was contributing symbolically in Jason's transition from boy to man on this day spent on the Deep River. The snapper, with its aura of danger and potency, was providing the noodlers with a test of nerve that was no sham. And speaking of an aura of danger and potency, America is privileged to count among her turtle species the *Tyrannosaurus rex* of all turtles, the alligator snapper. This "big brother" to North Carolina's common snapping turtle occurs in the lower Mississippi drainage, east across northern Florida and southern Georgia. Individuals may weigh as much as 220 pounds. A 103-pound specimen in captivity cleanly cut a broom stick in half with one snap of its jaws. My fly-fishing friend from Mississippi, Harry Steeves, told me that if a Deep South noodler finds himself inadvertently taking liberties with the rear end of an alligator snapper larger than the noodler himself, there is but one course of action. "One must immediately say something very sincere and apologetic, tip one's hat and back on out," Harry told me.

And so it came to pass that I found myself wading down Deep River, south of Greensboro this summer. I was in the company of Tonnie and his brother Vance, Jason, a freshman at the University of North Carolina at Asheville, Jason's father and two little boys. We started out innocently enough. We all remarked about how much cleaner the river looked than it had 10 years before when dye from textile mills had stained the water. We noted the freshwater clams and mussels that were making a comeback. As we waded downriver past the clearcuts in the hardwoods and the debris of garbage dumps, where refrigerators, TV sets, plastic tables and chairs, and even car bodies spilled down to the water's edge, I waxed poetic. I decreed that this garbage was "the dark side of 3 percent yearly economic growth."

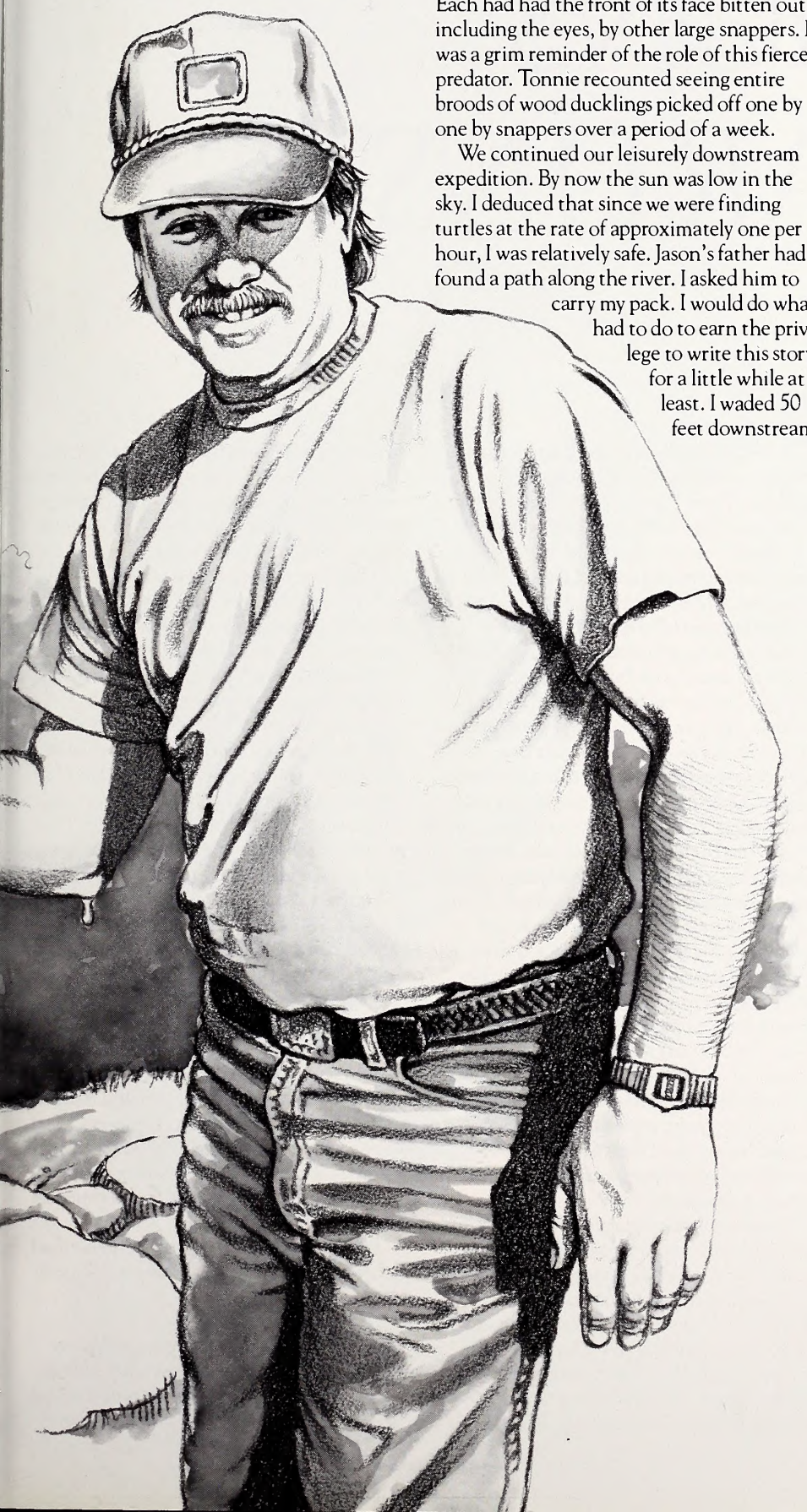
In sudden dread of risking my highly coordinated, banjo-picking fingers to the razor jaws of huge turtles, I did my best to turn the purpose of the trip into a health check on the Deep River and a bird-watching outing. I watched sullenly as Tonnie, Vance and Jason began to extend their arms far underneath the banks, underneath tree root systems and boulders, into places that would have made a water moccasin smile.

I noticed that the outing had divided itself into two groups, adult noodlers and little boy non-noodlers. There was absolutely no pressure on me to stop waffling, fence sitting and being wretchedly indecisive. I mumbled something about how slippery the rocks were, hoping others would appreciate my fear of dunking the expensive camera in my pack. I occupied myself in picture taking and note taking, becoming so busy in these endeavors that anyone could see that I had no time to fool with groping around for reptiles and amphibians. My purpose was far nobler.

I watched Vance go out of sight under water as he felt around under a pile of partly submerged brush. When his face popped up, he was grinning. He had a 15-pound turtle by the tail. He dropped it into one of the gunny sacks carried by the little boys. A little farther down the river, 45 minutes later, Tonnie let out a yelp and jerked his arm out from under the bank. He nursed a bleeding finger. "Forgot my own advice," he said to me, laughing. But in another moment he was back after the turtle in a little one-man war of nerves. We all watched the concentration on Tonnie's face as he lay on his side groping, once again locating the thoroughly enraged turtle. There was no turning back for Tonnie. His honor and reputation as a noodler were on the line. I watched in misery as Tonnie grappled with his opponent. He was having trouble finding the tail, for this rule-breaking turtle was facing the wrong way. We all stood in the nitrogenous stink of creek bottom mud as the battle of wills raged.



Suddenly he made a quick movement and stood up, the water falling off him, covered in mud. A nimble footed little 8-pounder dangled from his right hand. Tonnie dropped him into another sack. He turned to us and said, "He had his tail tight against his body. Tight as a bicycle kick-stand! Didn't want me to have it!"



As we continued our journey down the creek, Vance and Jim, Jason's father, each found a turtle in the late stages of starvation lying partly covered in mud, in shallow water. Each had had the front of its face bitten out, including the eyes, by other large snappers. It was a grim reminder of the role of this fierce predator. Tonnie recounted seeing entire broods of wood ducklings picked off one by one by snappers over a period of a week.

We continued our leisurely downstream expedition. By now the sun was low in the sky. I deduced that since we were finding turtles at the rate of approximately one per hour, I was relatively safe. Jason's father had found a path along the river. I asked him to carry my pack. I would do what I had to do to earn the privilege to write this story, for a little while at least. I waded 50 feet downstream from Jason and began to work my way up the shore line toward him. I gingerly palpated the muddy bank, down on all fours, my chin just above the water line. My fingers alighted momentarily on all manner of cold, hard, menacing objects on the bottom of the river. I watched Jason as we gradually drew closer. This was his second noodlin' foray and he was determined to grapple with a snapper, to see how he "measured up" on this summer's afternoon. I myself was determined to at least get wet and muddy so I could separate myself from the little boys group. I handled large boulders feeling delicatedly for the sharp serrations which would indicate the carapace of a turtle. I persisted at this for about 30 minutes as Jason and I drew closer.

Then when we were only about 15 feet apart, I heard him say softly, "I've got one." Tonnie, Vance and I all stood and watched Jason in his moment of truth. I uttered a silent prayer of thanks. It could have been me. Jason's eyes were far away. He knew there was only he and the turtle in all the universe. He felt carefully for the serrations which would indicate the rear of the shell; then he would seek the tail. There would never again be another first turtle for Jason. He must not be faint hearted. Suddenly he stood up and yanked out a handsome, athletic 20-pounder, the best turtle of the day. Jaws popping and claws raking the air, it was a fine specimen, neck as thick as my biceps and head larger than my fist. The turtle emitted a terrible stink, like a snake, worse than a skunk. We admired this relic from the age of dinosaurs as Jason beamed proudly, and rightfully so. Tonnie waded over to Jason and patted him respectfully on the back, being careful not to get too close to the turtle. "You'll never forget that turtle," he told Jason. I took a picture of Jason and his snapper. He was one step closer to becoming a humble, quietly confident man, and it showed on his face. The other turtles were released but Jason would keep his, keeping the shell and making a stew of the tasty flesh.

Tonnie said, "Let's go home." I quickly grunted my approval and climbed out of Deep River. As we walked down the highway we joked about our frightful appearance. Cars slowed down to look at us. The little boys yelled out that they were trying to decide if we were drowned rats or walking roadkills. Back at the parking lot, Jason showed his turtle to two girls sun bathing by the river. He told them he had yanked it out from under the bank. Their mouths dropped open. They decided that Jason was very brave. As for me, I wondered how I would have "measured up" to Jason's challenge at the age of 17 or the age of 43. It is a question I sincerely hope remains unanswered for the remainder of my years on this earth. ⊠

# MANSIONS of MARTINS

Purple martins are widely courted by loving landlords, but do these fascinating birds really control mosquitos?

written by David S. Lee
photographed by Ken Taylor

Several pairs of barn swallows had taken up nesting in the beams supporting the pier. There was no end to their coming and going as they busily fed their young. As they zipped over the clear, calm water, their images were mirrored on the lake's surface. So realistic were the reflections that our golden retriever jumped off the pier to catch the birds flying through the water. White Lake is known for its clarity, but this seemed extreme. Despite her failure to catch the swallows, Spot shook the excess water from her coat and prepared for the next dive. Higher overhead, purple martins, the largest, highest-flying and most popular of our swallows, foraged, catching my eye and giving me an idea. Martin houses ring the lake as many residents have provided accommodations for them. The closest was two piers down. There the birds swarmed around the house, consumed with the season's nesting activities.

"We could attach a martin house to this pier," I suggested to my father-in-law. He thought for a moment, carefully choosing his words. "We can enjoy those and won't need to clean up under them." This was probably the most objective statement I have ever heard concerning purple martins. For several minutes we watched their graceful aerial maneuvers, while Spot eagerly studied the surface of the lake.

The association of purple martins and man is probably unequaled in the world of birds. Indeed, the dependency is so strong that it takes some searching to locate authentic records of martins nesting in tree cavities and other natural hollows. There is a 1932 account of martins nesting among large boulders near a lake in Minnesota and a handful of records of martins in dead trees perforated with woodpecker holes. Yet, for most of us, these birds remain known only as commensal species, returning each spring to nest in everything from plastic milk jugs to fancy painted condominiums.

This close relationship is not new. American Indians—Choctaws, Chickasaws and probably others—had great respect for martins. They would clear the top branches from saplings near their cabins and hang hollowed gourds on the exposed limbs to encourage nesting. When saplings of the right size were not found near their cabins, the Indians erected poles on which they fastened crossbars to hang the nesting gourds. This custom was adopted by slaves on Southern plantations and the fascination with martins quickly caught on.

By the early 1840s, Audubon noted in his journals, "Almost every country tavern has a martin box on the upper part of its signboard; and I have observed that the handsomer the box, the better does the inn generally prove to be." The original interest among people living in rural areas was practical in that martins chased hawks and crows away from poultry. Martins flock together and the entire colony joins in to drive away intruders. Even eagles and vultures learn to avoid martin colonies. The days of free-ranging chickens are waning, but martins and their homes are more popular than ever.

By the 1960s, building martin houses had become a big business. In 1966, one Illinois

***Originally, martins nested** in tree holes, cliff niches or in other cavities, but today they are most visible nesting in gourds and other artificial houses.*

company sold 9,500 houses in the single month of February. Today, martins are encouraged because of the belief that they consume large numbers of mosquitoes. They don't but people who attract martin colonies to their backyards all swear that they do. For some reason, most seem reluctant to admit that they just like having martins around and enjoy the aesthetic appeal of the houses that they provide for them. It is estimated that over 1 million people are currently martin landlords. Whatever the attraction, it is a real one.

For me to state in print that martins don't consume legions of mosquitoes by the hour is going to be regarded as blasphemy by many readers. Let me explain. Martins are creatures of the sky and sun, gliding high and devouring large quantities of flying insects on the wing during daylight hours. Mosquitoes, however, fly near the ground, frequenting damp, protected places and are most active in the evening. There is little chance for martins and mosquitoes to cross paths, much less any opportunity for martins to consume mosquitoes in quantity. It is true that martins feed almost exclusively on insects, but this is also true of many birds.

So what do martins eat, if not mosquitoes? Food studies of martins are numerous, and many researchers from a variety of places throughout the bird's range have been curious about what they eat. The exact proportions of different kinds of insects vary greatly with location and season, but generally, ants (the flying stages), wasps and bees make up the largest portion (23 percent) of a martin's diet. In order of preference, these are followed by flies (16 percent), true bugs (15 percent) and beetles (12 percent). The remaining third of their diet consists of a variety of insects, one of the most common being dragonflies.

The regularity of dragonflies in martin diets is one matter, but many martins were examined that ate nothing else. This might be of no consequence, except for one thing. Dragonflies are credited with eating lots of mosquitoes, and that could prove embarrassing to people who preach the value of martins as a biological control for mosquitoes. On the flip side, however, I should note that martins will eat mosquitoes when they swarm, but they are not a major factor in their diet. All things considered, martins unfortunately do not play even a minor role in mosquito control.

As major predators of flying insects, martins are probably no more, or no less, efficient than other animals that prey on them—swallows, bats and dragonflies, for example. Nevertheless, martins are quite good at what they do. One 19th-century naturalist watched 16 pairs of birds for a day and noted that the parents made a total of 3,277 visits to the colony to feed their young. Martins have high activity levels and must eat a lot. This is partly because a considerable portion of their food is composed of exoskeletons and wings and is not digestable. The number of insects a martin eats in a day, as pointed out by a naturalist in the 1920s, is "not only beyond calculation but almost beyond comprehension."

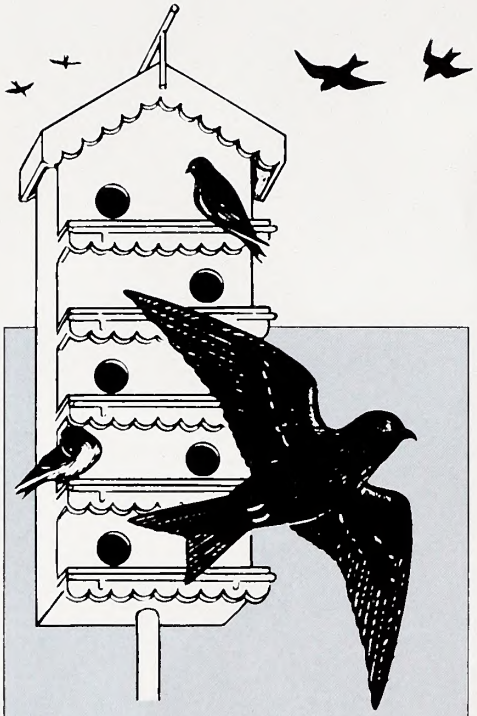
There seems to be no end to what some people will go through to attract purple martins to their yards. Some, not satisfied with just the presence of martins, become preoccupied with how many martins they can house. We have all seen yards filled with martin gourds and complex mansions on poles. Even plastic jugs are hung out. Often the fine line between a colony and an avian slum would be hard to draw. In Louisiana there is a man who, I think it is safe to say, is truely obsessed with martins. In his front yard is a 620-compartment martin house supported on four massive poles. It's a sight to behold. Some of his neighbors think so too.

Commercially available martin houses come in a variety of designs and prices. Expect to pay $70 to $270 for a good one. Plans to build your own are available, but a multi-compartment bird house requires a fair amount of carpentry. If you place much value on your time, it is probably more practical just to buy one.

Most people who fancy martins will admit the problem is not in choosing a design for a house, but in getting the martins to adopt a new neighborhood. There is no set of guidelines to follow that will ensure occupancy by martins. They nest where they want to, and places that seem perfect to us are sometimes never used. Nevertheless, here are some tips that will help you determine if you are wasting your time even thinking about attracting your own martin colony.

- **Habitat evaluation.** Generally open areas are preferred. Martins most often establish new colonies near areas such as fields, farmlands, ponds, lakes, rivers and bays. They can be attracted to residential areas, but not to those that are heavily forested.
- **House placement.** The area within 40 feet of the martin house should be clear of trees, buildings or other tall structures. The taller the trees or buildings the farther the martins need to be away from them. Placement of the house in the center of the open area gives the best results. Most houses are erected 12 to 20 feet above the ground.
- **Patience.** Some people wait years for birds to show an interest in the housing they've provided, but once established, the colony should persist as long as the house is maintained.

While martins colonize areas where flying insects are plentiful and the landscape is open enough for them to hunt, chances are you will have a difficult time attracting them if you



## Martins and Friends

One of the best ways to indulge a fascination with the purple martin is to join the Purple Martin Conservation Association. Membership includes a handsome quarterly magazine, colony site registration, participation in research and other benefits. You can learn how to build a martin colony and share information with other colony landlords. For more information, write the Purple Martin Conservation Association, Edinboro University of Pennsylvania, Edinboro, PA 16444.

***Martins are the** first of the migratory birds to appear each spring, but the high-flying birds don't eat many mosquitoes, despite the general belief that they do. Mosquitoes haunt damp, low-lying places mostly in evening hours, while martins are daylight feeders.*

don't see any martins in the area where you live. You can improve the odds by putting the house up about the first of March, then take it down in early September. This will help prevent starlings and house sparrows from taking it over. Unlike martins, these species are not migratory and they begin nesting earlier in the year. Annual cleaning of the house may discourage nest parasites. At least 27 kinds are known for martins, and scores for both starlings and house sparrows.

Finally, if you're desperate, you may want to try calling your martins to get them to visit. Recordings of purple martins are available for $8 (record) and $10 (cassette) from the Purple Martin Conservation Association (price includes postage). Played through a "boom box," the sounds attract martins, and if the conditions are right, the birds may stay and nest. If not, you can always listen to them; you just need to change batteries.

Now that we know that purple martins are not key agents in local mosquito control and that they are often, despite their dependence on man, difficult to attract to new sites, we are still plagued with one question. What's so darn interesting about these particular birds anyway? Part of it may be that the arrival of spring is often associated with certain birds—robins, blue birds or geese. However, martins are the first of the highly migratory birds to be seen each season. The latitudinal position of North Carolina creates weather conditions that allow many species to remain here in winter. Robins and others often simply make local movements southward as cold advances. Martins, on the other hand, leave the country and winter primarily in the Amazon valley of Brazil. They return by late January to Florida and by April are distributed throughout their North American breeding range.

In North Carolina, the spring migrants arrive during the first weeks of March. Their return to North America, and to our yards, is spectacular, and surely part of their appeal to us. We know they have come in large flocks migrating directly across the Gulf of Mexico in their rush to arrive. Their autumn disappearance is usually as abrupt as their arrival. The birds flock-up—sometimes late-summer roost concentrations of 100,000 individuals appear—and then on the first cold front they take off for South America, again flying directly across the Gulf.

The song of martins is to some ears unmusical and while individual notes lack the charm of thrushes, the cumulative vocal effort of a colony is soothing. The chatter is not only restful, but tells us that all is well in the world of martins, and perhaps ours as well. Possibly they are bragging about their expensive homes, or laughing about ones they passed up. ☒


## You Make a Difference!

NORTH CAROLINA NONGAME & ENDANGERED WILDLIFE FUND

Your donations to the Nongame and Endangered Species Program mean that many endangered species have a chance for survival. Please keep giving. Make your contribution directly or through the state income tax checkoff to the Nongame & Endangered Wildlife Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27604-1188.

*Donations Topped $500,000 in 1990-91*

# Nongame and Endangered Wildlife Program Has Busy Year

*Written and Edited by Vic Venters*

Each year, North Carolina residents may check a line on their state income tax form to designate any or all of their refund to the Wildlife Commission's Nongame and Endangered Wildlife Fund. The fund is used by the Wildlife Commission to manage and protect nongame wildlife species that are endangered, threatened or of special concern. Last year, donations topped the half million dollar mark. Projects funded with these donations included assistance for peregrine falcons, bats, mussels, the spotfin chub, northern flying squirrel and other nongame species.

Biologists with the Wildlife Commission, the U.S. Fish and Wildlife Service and the U.S. Forest Service released 11 captive-bred young peregrine falcons in Macon County this summer. A survey of the mountain's peregrine territories during the spring showed that reproduction was not good. Biologists released additional young to offset the poor performance of the adult breeding pairs.

Several parties, including the U.S. Fish and Wildlife Service, neighboring state wildlife agencies and Duke Power Company provided financial assistance to the Commission for the peregrine research.

The Wildlife Commission and the Fish and Wildlife Service are starting the second year of the two-year survey of area caves and mines for populations of rare bats. Last year, biologists conducted a census of hibernating populations of several species, including the Virginia big-eared bat, the eastern big-eared bat and the small-footed myotis.

Nongame biologists discovered a major die-off of mussels, including the federally endangered Tar River spiny mussel, in a tributary of the Tar River in 1990. Dr. Jim Fleming at N.C. State University has determined that the introduction of an agricultural pesticide caused the die-off.

Nongame biologists have also completed survey work in North Carolina which may result in the federal listing of three freshwater mussel species as endangered, threatened or species of special concern. Expanded public support is now needed to help with research and management of these species.

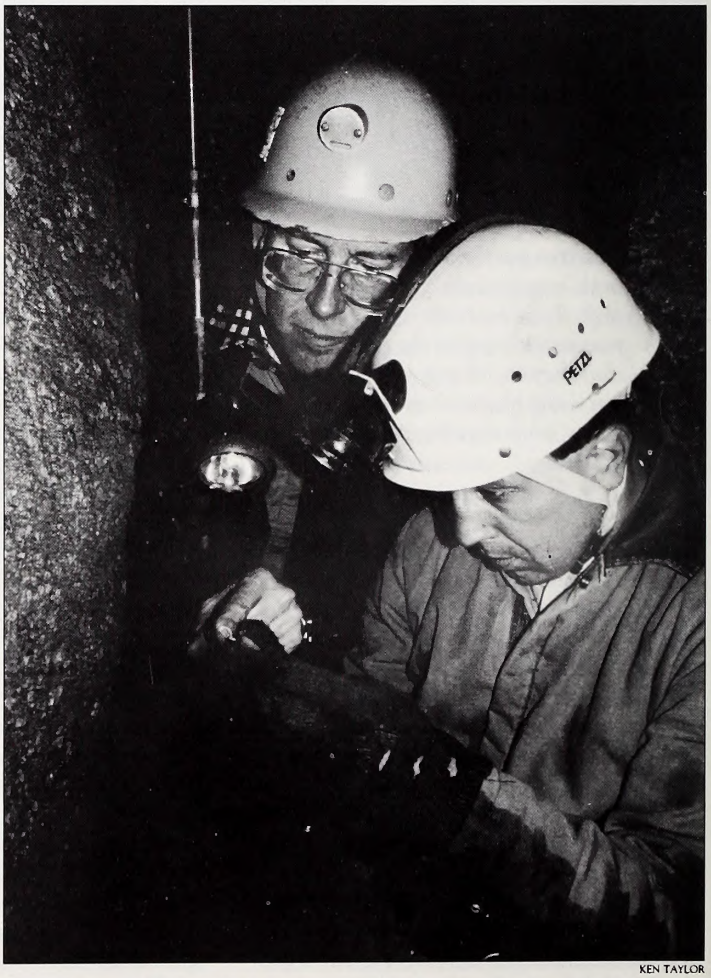
A two-year study has been initiated with seed monies from the Natural Heritage Trust Fund to intensively survey the Swift Creek sub-basin in the Tar River Basin. Nongame biologists are responsible for surveying for mammals, mollusks, fish and crayfish, while biologists from the Natural Heritage Program and the N.C. State Museum of Natural Sciences are surveying the plant communities, birds, reptiles and amphibians. The Swift Creek sub-basin project will lay a foundation for expanded conservation of this important habitat by working cooperatively with local landowners.

The spotfin chub, a state- and federally listed fish species, continues to maintain a healthy population in the Little Tennessee River. For the past four years, spotfin chub from the Little Tennessee have been moved to Abrams Creek in the Great Smoky Mountains National Park to reestablish a protected population there.

The Wildlife Commission, Wake Forest University and the U.S. Fish and Wildlife Service will soon complete a five-year study of the Carolina northern flying squirrel. The study began in 1986 with a search throughout the state's mountains for populations of this nocturnal squirrel. Researchers have located eight northern flying squirrel populations to date. Only three populations were known in 1986. Wake Forest University scientists have used radio tracking equipment to observe flying squirrel behavior on Roan Mountain. One interesting discovery is the squirrel's apparent need for a large home range. Some squirrels moved up to one kilometer in a single night.

Figures provided to the Wildlife Commission by the state Department of Revenue show contributions reached $510,269 during fiscal year 1990-91. Since being enacted by the N.C. General Assembly in 1983, contributions bring the total amount received by the Nongame and Endangered Wildlife Fund to nearly $3 million.

*— Tom Henson*



KEN TAYLOR

***Bat Biologists:*** *The Wildlife Commission uses monies from the Nongame and Endangered Wildlife Fund to conduct research on a variety of rare or endangered species such as bats. Last year, donations to the fund topped $500,000.*

*Bottomlands Critical for Wildlife, Water Quality*

## Half of North Carolina Wetlands May Lose Protection

More than half of the North Carolina lands currently classified and regulated as wetlands could be removed from protection if rules proposed last summer by the Bush-Quayle administration are adopted by the Environmental Protection Agency, U.S. Army Corps of Engineers, the Fish and Wildlife Service and the Soil Conservation Service.

According to scientific field studies conducted in the late summer and fall of 1991 by a state government team on 11 bottomland hardwood forest sites, revisions to the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* would cause a 44 percent loss in regulated wetland of that type.

The manual has been used by all federal agencies to determine what lands are regulated as wetlands. Under this manual, wetlands are identified and their boundaries marked based on the use of three criteria—soils, vegetation and hydrology. Since adopting the manual in March 1989, the federal government had defined wetlands hydrologically as areas where water saturated the soil within 18 inches of the surface for at least seven consecutive days in the growing season.

Under the proposed new definition, wetlands have to show standing water for 15 consecutive days or be saturated at the surface for 21 days in most years.

The state's team of scientists focused its testing efforts on bottomland hardwood forests—the frequently flooded areas along rivers and streams—at the suggestion of the U.S. Army Corps of Engineers, which regulates development in wetlands under Section 404 of the Clean Water Act. The N.C. Division of Environmental Management coordinated the field studies and report. Other agencies participating included the state's divisions of soil and water, forestry and coastal management.

In addition to examining bottomland hardwoods, the team also estimated what effects the proposed changes in the wetlands manual could have on all types of regulated wetlands in the state. The team predicted about a 51 percent loss in regulatory protection for the state's remaining 5.7 million acres of land currently regulated as wetlands. About half of these potential losses would come from bottomland hardwoods and about half would result from the removal of some "wet pine flatwoods" from regulation, according to the DEM report. In addition, there would be a loss of some pocosins and most pine savannas.

For bottomland hardwoods, the estimated 44 percent loss in jurisdictional acreage would remove regulatory protection from about 1.2 million acres.

Seasonally flooded bottomland hardwoods provide some of the state's best habitat for white-tailed deer, wild turkey and woodcock. In winter months, flooded hardwoods provide superb wintering habitat for wood ducks, mallards and other waterfowl which forage on acorns and other mast. Bottomland hardwoods are important habitat for aquatic furbearers such as mink, otter and beavers, and in many urban areas of the state, these ecosystems provide some of the last travel corridors for a wide variety of wildlife species.

When flooded, bottomland hardwoods also provide vital spawning grounds for anadromous fish species like herring and shad. "Herring can't spawn anywhere but in floodplains," said Wildlife Resources Commission habitat biologist Dennis Stewart, "where you can kick up dust in a summer drought."

One of the most important functions of hardwood bottomland wetlands is protecting surface water quality. Because they provide protected buffer areas around streams and rivers, hardwood bottomlands help filter out sediment and pollution before they reach major bodies of water. Some of North Carolina's largest and best known bottomland hardwood ecosystems are protected by federal and state ownership with the Roanoke River National Wildlife Refuge.

However, other Roanoke River lands, and most other floodplains in the watersheds of the Cape Fear, Neuse and Tar Rivers, are not publicly owned. The state field studies show that many of the smaller tributaries of these rivers—Sampson County's Greater Coharie Creek, for example—could have almost total loss of regulatory protection, with only the perennial stream and immediately adjacent floodplain remaining as "wetlands" if the proposed rules are adopted.

*—Ed Harrison*

## Dixie Deer Classic

Several popular deer hunting experts and noted management specialists will highlight the 12th annual Dixie Deer Classic in March. The popular three-day event will be held March 6 through 8 at the N.C. State Fairgrounds in Raleigh.

Among the experts presenting seminars will be Dick Idol, writer for *North American Whitetail* magazine; Gary Sefton, expert on deer vocalization; Joe Hamilton, biologist and founder of the Quality Deer Management Association; and Chuck Adams, noted bowhunter.

In addition to the seminars there are also commercial displays and booths for hunting equipment, outfitters, conservation groups and related exhibits.

Hundreds of trophy mounts from North Carolina and the Southeast are brought in each year for scoring according to Boone & Crockett standards.

For more information, contact the sponsors at the Wake County Wildlife Club, P.O. Box 12202, Raleigh, NC 27605.

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before travelling to an event.

**Feb. 8-9**

The Coastal Carolina Wildlife Exposition will be held in the Coastline Convention Center in Wilmington and will feature wildlife art. For more information, contact the Greater Wilmington Chamber of Commerce, 505 Nutt Street-Ste, A-Bldg. B, Wilmington, NC 28401.

**Feb. 14-16**

The 10th annual Southeastern Wildlife Exposition held in Charleston, South Carolina, will feature over $20 million in collectible wildlife art, including original paintings, sculpture, prints, fine guns and conservation exhibits. For more information, contact the Southeastern Wildlife Exposition, P.O. Box 20159, Charleston, SC 29413, or call (803) 723-1748.

*N.C. Sportsman's Alliance is Growing*

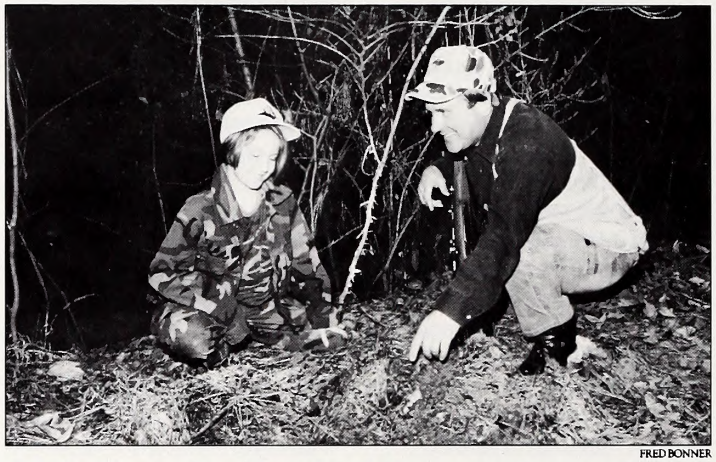
# Tar Heel Sportsmen Organize to Protect Tradition

As a hunter, are you concerned about threats to your favorite sport? Do you want to ensure that wildlife management remains in the hands of professional wildlife biologists? Are you worried that vital programs you originated and funded, like wildlife refuges, may be changed and crippled? Are you concerned that non-ethical hunters are distorting the image of true sportsmen who care about the welfare of all wildlife?

If you can answer yes to these questions, Strat Donnell, Jr. would like to tell you about the North Carolina Sportsmen's Alliance, a relatively new non-profit organization whose goal is to protect and preserve responsible hunting. Calling itself the "Voice of the responsible hunter," the Alliance was incorporated in June 1990.

"It came about as a result of years of after-hunt conversations when a number of us would express our concerns without knowing what to do about them," said Donnell who is the executive director of the group. "We talked about the fact that there was no professional representation of the hunter in North Carolina. Most wildlife groups have a broad goal like conservation, or they're species-oriented or product-oriented. They do fine work, but the general hunter in North Carolina has not had an organization solely dedicated to expressing his concerns, or one that can help him protect his rights. That's why we decided to form the Sportsmen's Alliance."

In addition to Donnell, who is the professional staffer, the group has elected Jim Stephenson of Raleigh, president; Bob Hazel of Garner, vice president; Randy Strait of Durham, secretary and Bill Little of Raleigh, treasurer. All, including Donnell, are volunteers. Membership is growing, but Donnell stresses that this means members must be licensed hunters who abide by a strict code of ethics.



FRED BONNER

***Help for Hunters:*** *Strat Donnell (right) is executive director of the N.C. Sportsman's Alliance. The organization seeks to preserve hunting for future generations.*

In addition to uniting hunters against anti-hunting efforts, the group has a number of other objectives. Some of the most important include: monitoring issues and legislation that may affect hunting or wildlife management; sponsoring sound hunting or wildlife related legislation; promoting professional wildlife management; improving hunter-landowner relationships and promoting hunters as the original conservationists.

"If you hunt and fish in in North Carolina, you need representation," said Donnell. "We seek to preserve and promote our outdoor freedoms and ensure the survival of the fellowship and bonding that comes about through outdoor activities. We also want to ensure that these things are available to our children and future generations. We're concerned that because of pressures from uneducated or misinformed groups, our freedoms will be compromised or outlawed.

"In a number of states serious threats exist for hunting. Indeed, we fear that in some states hunting might be seriously curtailed or outlawed if the issue were taken to public ballot. However, it is our belief that the role of hunting should not be a matter of vote, but best left to professional biologists and wildlife managers. We also feel this is in the best interest of all wildlife species. We want to encourage the continuation of the best possible professional management for all species—including nongame, threatened and endangered species—rather than have their fates in the hands of those who do not understand wildlife population dynamics."

Donnell feels that in some parts of the country, hunters are also a valuable threatened species that have traditionally provided most of the impetus and funding for programs that enhance all wildlife populations.

"If you subtract the hunter, the system will fall apart," he said. "Other means of funding are simply inadequate. Even volunteer donations for popular endangered species programs have had limited and unstable success, so we feel that sportsmen are now, and will remain, the key to sound wildlife management.

"If sportsmen join together and present a responsible, ethical image of hunters who care about the future of all wildlife, we believe we can have a beneficial impact." Those who are interested in joining or learning more about the North Carolina Sportmen's Alliance can write Strat Donnell, Jr. at PO Box 21163, Raleigh, N.C. 27611, or call 919-781-4570.

*—Jim Dean*

## Field Notes

| | |
|---|---|
| Rabbit | Closes Feb. 29 |
| Bobwhite Quail | Closes Feb. 29 |
| Ruffed Grouse | Closes Feb. 29 |
| Snipe | Closes Feb. 28 |
| Snow and Blue Geese | Closes Feb. 10 |

Information on bag limits, either-sex hunts and other regulations may be found in the *1991-92 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest*. For a copy, check with license agents or contact the N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27604-1188.

*Dealer Sells to Wrong Man*

## Wildlife Commission Officer Bags Illegal Bear Jewelry

A flea market salesman from Oklahoma and his wife are out more than $10,000 after picking the wrong customer in Morganton to entice with jewelry made from black bear claws.

Captain Joe Story, a veteran Wildlife Commission enforcement officer, was off duty while shopping at the Jamestown Flea Market in Morganton when he spotted a sales display of Indian jewelry made of turquoise, silver and black bear claws.

The jewelry included a 12-claw necklace, two eight-claw silver necklaces with matching earrings, four bear-claw belt buckles, three bolo ties and one gold bear-claw pendant.

A sign above the jewelry read "For Display Only in North Carolina."

North Carolina law prohibits the sale of wildlife parts and sets a minimum fine for illegally taking, possessing, transporting or selling a black bear or its parts. One reason for this law is to discourage bear poaching.

"When I commented on how high the prices were, the woman told me I could have any piece of jewelry for half the marked price," Capt. Story said. "I told her I'd have to think about it."

Capt. Story went to a telephone and called for on-duty wildlife officers to come to the flea market. He returned to the couple's booth and bought a bear claw for $50. "When I offered to buy a pendant she told me she didn't want anyone to see the deal," Story said. "She asked her husband for permission to sell the pendant. He approved the deal and she took my money and put it in her pocket quickly.

"When I showed them my badge and identified myself as a wildlife officer, the woman said, 'Uh, oh, we've sold to the wrong people.'"

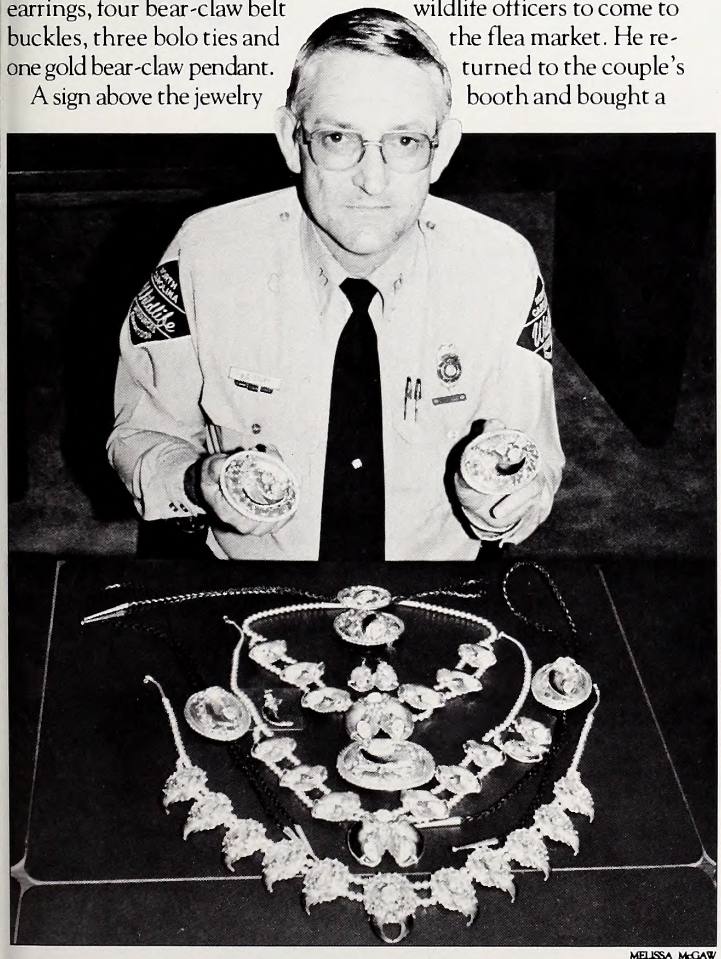
When the case went to Burke County District Court in July, the salesman pleaded guilty. He was handed a two-year suspended sentence, fined $2,000 and ordered to turn over to wildlife officers the remainder of the bear-claw jewelry for use in undercover work. The jewelry's value was estimated at $8,500.

Story said the claws apparently came from bears killed in Canada, and the jewelry was made in New Mexico. The salesman was charged with violating a state law prohibiting the sale of black bears or their parts. The man's wife was not charged.

Three years ago, an undercover investigation conducted by state and federal wildlife officers targeted the black market trade in bear parts that is threatening the black bear population in the Great Smoky Mountains National Park and U.S. Forest Service lands.

The probe revealed a flourishing market in bear parts with a large number of bears killed during the closed season or in the park. The parts sold included the head, hide, claws, meat and the gall bladder, a part especially prized by Asians for its supposed medicinal value.

*—Angela Dorman Hill*



MELISSA McGAW

**Parts Is Parts:** *Wildlife Commission officer J.C. Story shows off a collection of jewelry made from bear claws confiscated when dealers illegally tried to sell the items at a flea market in Morganton. A North Carolina law prohibits the sale of bear parts in the state.*

## Wildlife Endowment Fund Report

**Nov. 30, 1991**

Principal Balance
$16,398,269.46

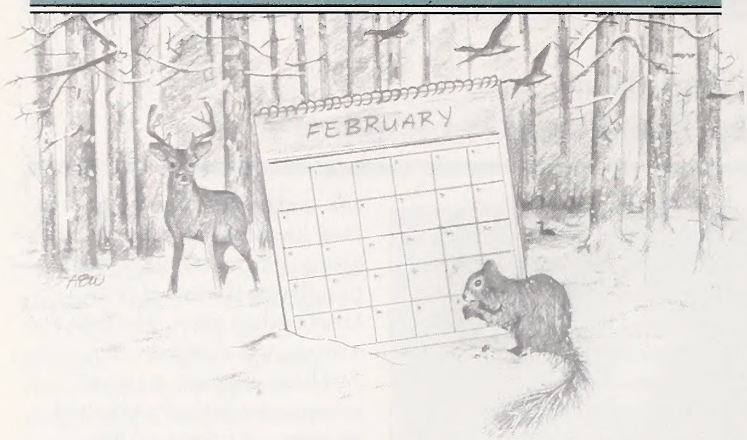
Interest Earned
$8,510,861.17

Total Receipts
$24,909,130.63

Interest Used
$3,282,016.448

Fund Balance
$21,627,114.15

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.




# Now's the Time to Plant Lespedeza

*by Vic Venters*

If you want your lands to produce lots of wildlife this year, the amount and quality of habitat work you do during the spring will directly influence wildlife populations later in the year.

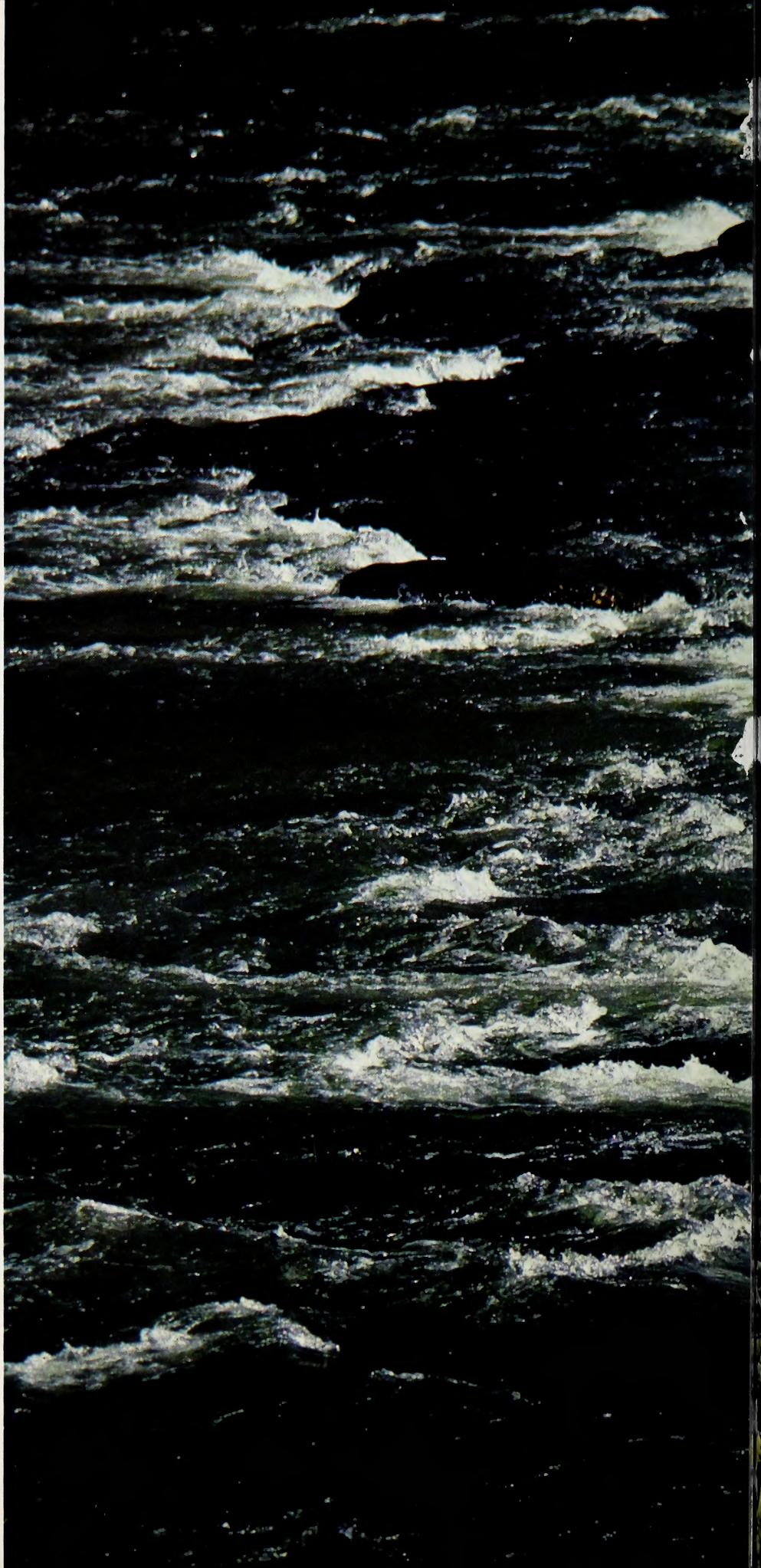
*What Ye Sow:* February is prime lespedeza planting time. Annual lespedeza types such as the kobe or Korean varieties provide superb quail food and good rabbit forage because of their heavy seed crop. Any ground that has exposed soils will do for planting, and plowing isn't necessary for the seeds to take. Areas to consider for planting are exposed roads, logging decks, disked areas and freshly burned areas. However, Korean or kobe lespedeza will not grow well where there is an established sod, leaf cover or heavy weeds. Fertilizers usually aren't needed. Simply sow the seeds on the exposed ground and do not cover seeds with soil, or cover only lightly. Be sure to remember to locate plots near adequate cover so that small game have protection from predators. On decent soils, annual lespedezas will usually reseed their stands for up to three years, although on sandy, poor soils, annual reseeding will probably be necessary. Wildlife food plots, planted with legumes such as lespedeza, can be highly beneficial for many species but they are not a panacea for all habitat deficiencies.

*Prune for Fruit:* This is one of the best months to prune wild fruit-bearing trees before the sap rises and dormancy breaks next month. Your goal will be remove enough branches and twigs so that the interior branches of the tree get plenty of sunlight. This will produce more fruit in the growing season. Also, you'll want to remove any dead or dying limbs. Fruit such as apples will attract many game and nongame species, especially deer, turkey and grouse.

*Fill'er Up:* If you've partially drained your pond over the winter to control aquatic weeds or alter the predator/prey balance between bass and sunfish, you'll want to plug the drains in your water-control structure to allow the pond to fill up with spring rains. An optimum time to plugs drains would be late-February, early March. This way, fish will have suitable spring spawning grounds in your pond's now exposed shallows.

# The New Nongame Print Is Now Available!

To support the North Carolina Nongame and Endangered Wildlife Fund, purchase your new Nongame print "North Carolina Creeks," by Brooks Pearce.
See order form facing p. 32 for details.



## Spring Smallmouth

High water is normal in spring on the New River and other large rivers in western North Carolina, but smallmouth bass fishermen find it often pays to get an early start on the season.

Second-class postage paid at
Raleigh, North Carolina

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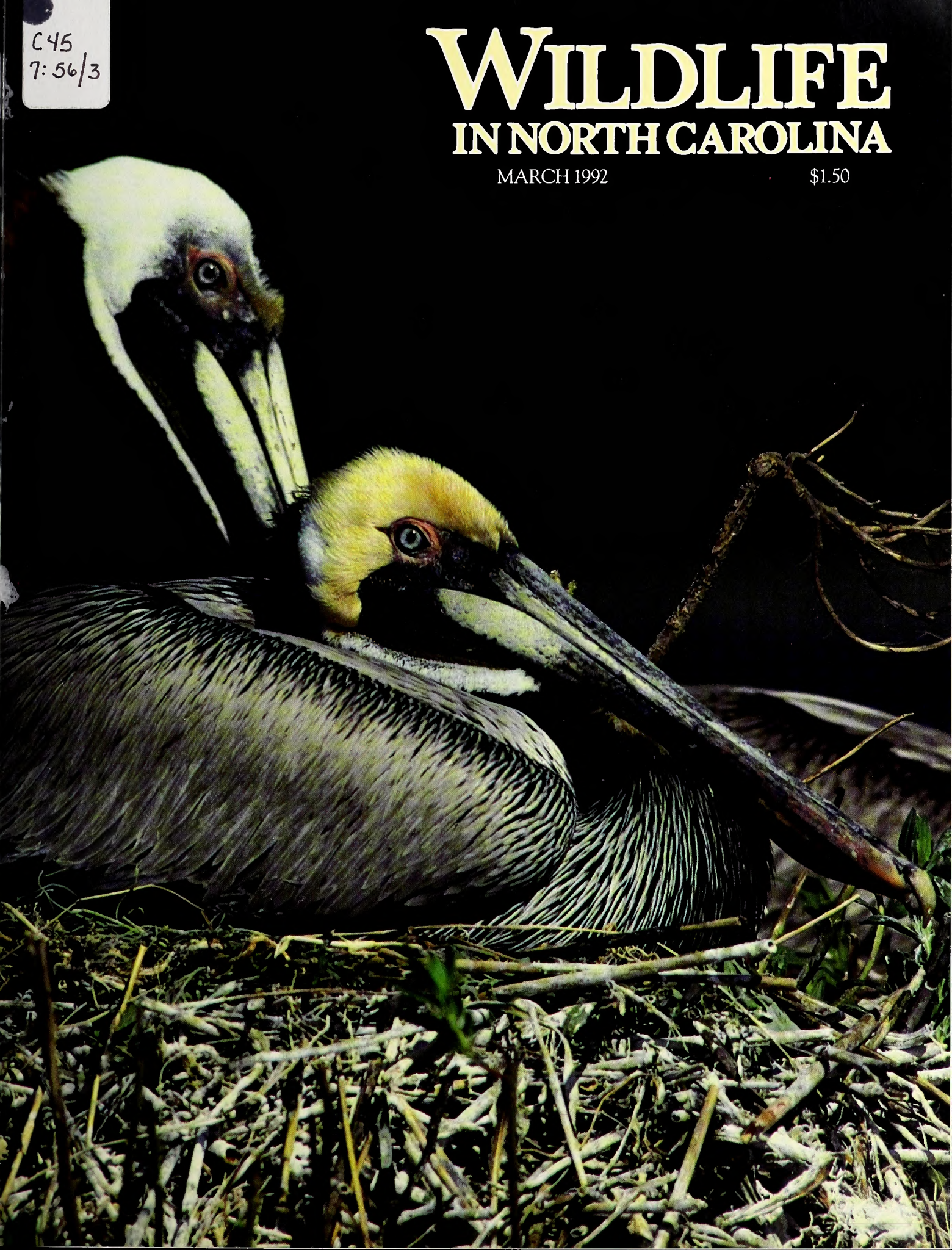
# WILDLIFE IN NORTH CAROLINA

MARCH 1992 $1.50



# The News From Waseca

*by Jim Dean*

Spring is here, or soon will be. You can tell by the catalogs that bloom in the mail box. Wordsworth, a daffodil man by all accounts, would not have liked it, but these days he'd be just another occupant. Most of us could probably do without the bulk of these mail-order harbingers, but there is one catalog I miss.

For many years, until the company bit the dust in the mid-1970s, I looked forward to receiving the annual inch-thick catalogs from Herter's, Inc. of Waseca, Minnesota. Recently, I ran across an old copy and spent several nostalgic hours reading it. Many readers will remember them fondly.

Each Herter's catalog had a distinctive red, black and yellow cover inscribed with a coat of arms. In its typical, quirky way, the company described itself as "The authentic world source for fishermen, hunters, guides, gunsmiths, law enforcement officers, tackle makers, forest rangers, commercial fishermen, trappers, explorers, expeditions, backpackers, precious gems for investors, couturier silks and hobby crafts." It was all that, and much more.

Founded in 1893, the company's specialty was fully equipping expeditions to Hudson Bay or other remote parts of the globe. The range of products was truly astonishing, and included complete lines of guns, tackle, archery gear, taxidermy equipment, decoys, boats, motors, snowmobiles—even exotic foods, candle molds and teddy bears. If you wound up in some out-of-the-way place like Nepal or Minto Flats, Alaska, you could order everything you needed, then spend the winter reading the catalog.

Reading was the fun part. Unquestionably, George Leonard Herter and his remarkable family were experienced and widely traveled sportsmen with useful insights and knowledge. But to hear him tell it, he had invented nearly everything, including items any discerning reader would recognize as pure ripoffs. George also apparently wrote almost all the pompous, grammatically fractured and wonderfully weird copy that accompanied the ads.

He loved to disparage competitors' products and regale you with outrageous claims and strange, truncated facts. George didn't merely sell a hat, he force-fed you his history of hats. In an ad for golf clubs—golf clubs!—he stated that "They really have not been changed except by Herter's since King James II of Britain in 1457...." His ad for an electric shaver reads: "The shaver has no gimmicks like bars that are supposed to roll whiskers into slots which is impossible to do if you just stop to think about it."

Throughout the years, George could never decide whether his company was singular, plural, possessive or incorporated. Thus, one encounters the oft-repeated motto that "Herter's Have Tomorrow's Products Today."

Yet, where else could you order Herter's famous buffalo chip candy or Herter's authentic cactus Sioux ghost dance candy? Or Hudson Bay North Breeze aftershave lotion that "contains a real deodorant that really deodorizes"? Or a cast-in-sand iron corn bread maker hawked with copy that traced the development of iron to Lief Erickson? Or Herter's authentic sperm whale harpoons for use as fireplaces tools? And who would not want one of Herter's wild rice benedictine fruit cakes that "contain no trash fillers like orange peel and citron as used in present day fruit cakes?" Especially since George thoughtfully added "We do not try to make any money on them." As he would say, "Order one out."

George also wrote many books in the same slap-dash style. Who could resist *How To Get Out of the Rat Race and Live on $10 a Month* or the three volumes of *Bull Cook and Authentic Historical Recipes and Practices* which, he claimed, included the favorite recipes of everyone from Jefferson Davis to Genghis Khan? Yet, George wasn't always full of beans. His book on fly tying is still highly regarded. It sold for $3.27 ($4.37 deluxe edition).

Prices were reasonable, some downright cheap. Amazingly, quality was often very good, though a bit uneven. Throughout the 1960s and early '70s, I ordered most of my fly-tying materials from Herter's, and I still have a serviceable glass spinning rod I built from components for $4. For a surprisingly modest price, you could put together your own custom rifle with a fine English-made Mauser action and legendary Douglas barrel, and match it to a high-quality gunstock of myrtlewood, birdseye maple or fancy fiddleback French walnut. Those lovely stocks ranged from $15 to $85.

In recent years, the Herter's name has been revived for a line of waterfowling gear, but the catalog is not the same. If you ever encounter one of the originals, read it and shed a tear for the grandest mail-order missive of them all.

March, 1992
Volume 56, Number 3

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Health, and Natural Resources

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Wildlife Through the Year** *by Vic Venters*

**Cover** *Brown pelicans like this male and female (on the nest) have made an astounding comeback since DDT was banned. Photograph by Ken Taylor.*

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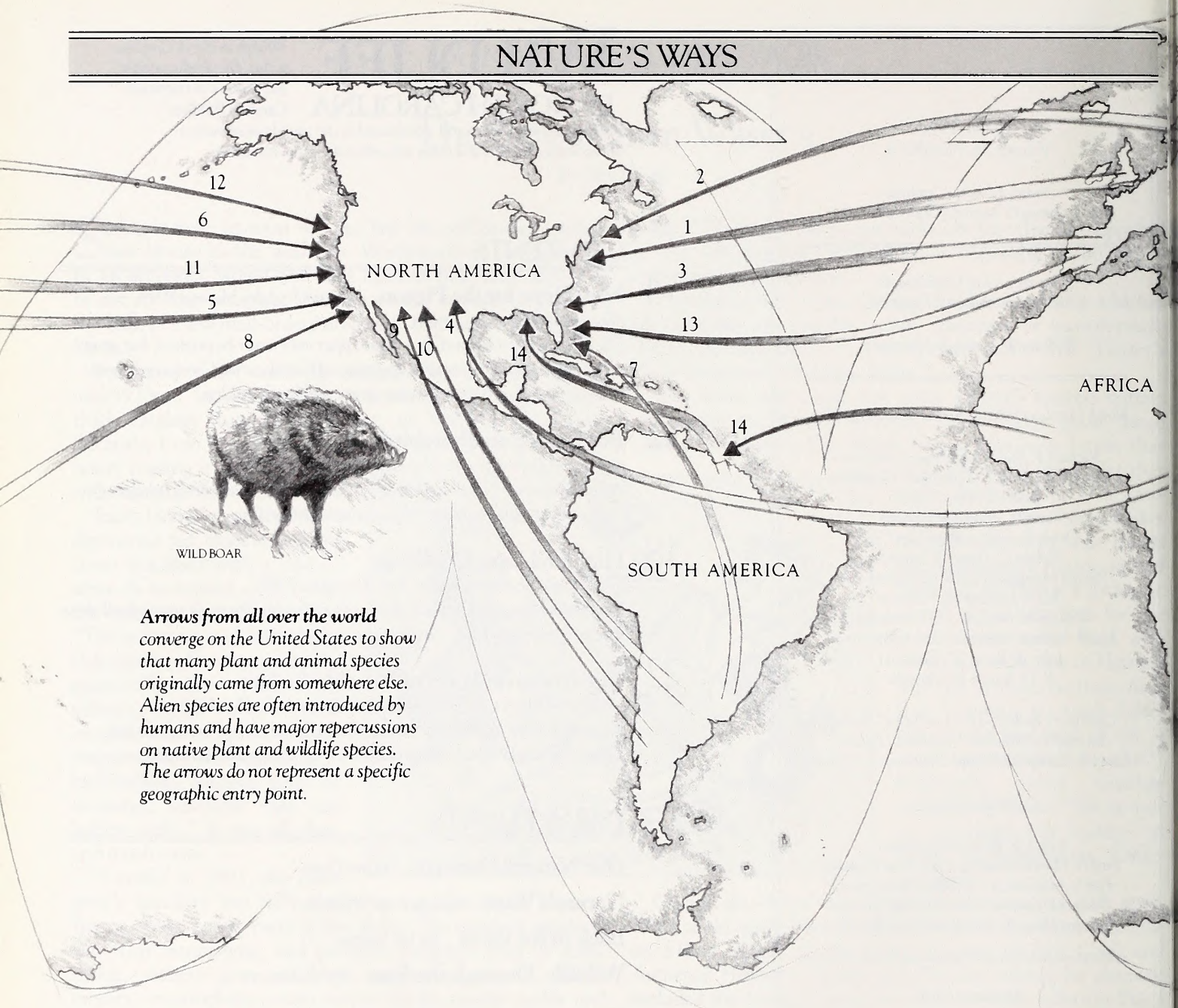



***Arrows from all over the world*** *converge on the United States to show that many plant and animal species originally came from somewhere else. Alien species are often introduced by humans and have major repercussions on native plant and wildlife species. The arrows do not represent a specific geographic entry point.*

# Aliens in Our Midst

*written by Lawrence S. Earley*
*illustrated by David Williams*

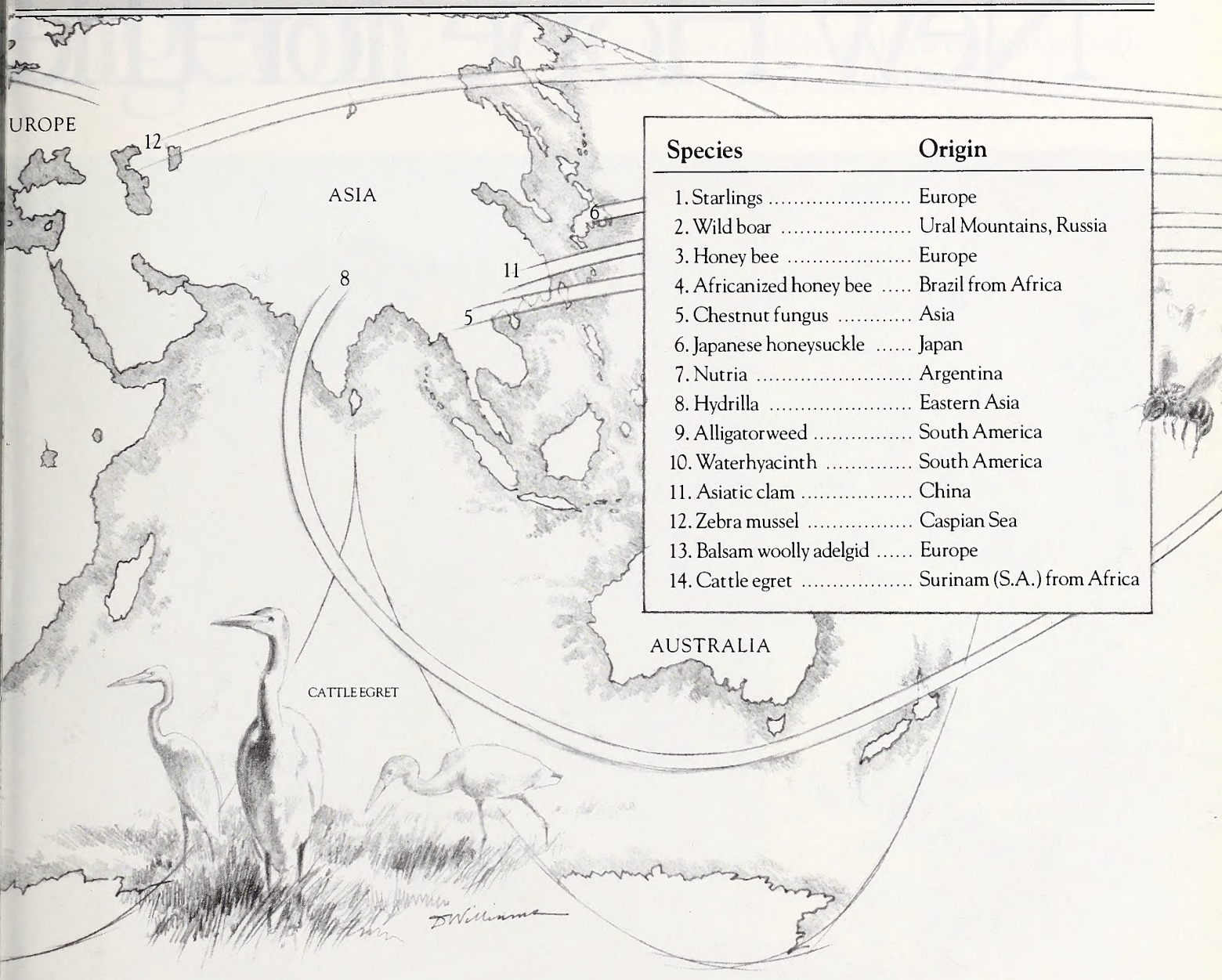
In H.G. Wells' *War of the Worlds*, aliens from outer space are initially successful against the massed armies of Earth because of their advanced technology. Invincible against human weapons, however, the space invaders eventually succumb to a force they have no resistance to—microscropic germs.

In our native ecosystems, there are similar battles going on all the time between native and alien species, yet it's the aliens that are often the victors, the natives that are vanquished. Why is that?

These alien species—also called exotics—are plants and animals that do not evolve in a given ecosystem but are introduced from without. Sometimes these introductions have come about by perfectly natural processes, as when the African cattle egret flew by its own power into South America and then made its way up the East Coast of the United States. But most of the time the exotics are introduced by humans, either accidentally or deliberately, with devastating results on native species.

Examples of accidental introductions of exotics are notorious in this century: an Oriental fungus that killed off the chestnut trees; the balsam woolly adelgid that is today devastating the Fraser fir forests of the Appalachians; another Eurasian fungus that is attacking hemlock trees; another that threatens to wipe out native dogwood trees.

Anglers are aware of the many ponds and lakes in North Carolina choked by releases of exotic plants like hydrilla, water-hyacinth and alligatorweed. The Asiatic clam is replacing native clam species in our rivers and streams, and one of the worst exotic scourges, the zebra mussel, is slowly making its way south




| Species | Origin |
|---|---|
| 1. Starlings | Europe |
| 2. Wild boar | Ural Mountains, Russia |
| 3. Honey bee | Europe |
| 4. Africanized honey bee | Brazil from Africa |
| 5. Chestnut fungus | Asia |
| 6. Japanese honeysuckle | Japan |
| 7. Nutria | Argentina |
| 8. Hydrilla | Eastern Asia |
| 9. Alligatorweed | South America |
| 10. Waterhyacinth | South America |
| 11. Asiatic clam | China |
| 12. Zebra mussel | Caspian Sea |
| 13. Balsam woolly adelgid | Europe |
| 14. Cattle egret | Surinam (S.A.) from Africa |

to North Carolina and its ravages will soon be felt.

Deliberate introductions are no less rare: 60 European starlings released in New York City in 1890 today number 200 million and threaten native cavity nesters. Wild boar from Russia, escaped from a hunting preserve in the North Carolina mountains, have thrived and today root up native mountain vegetation with their tusks. Kudzu, introduced from Japan in the late 19th century as an ornamental and promoted later for erosion control, now consumes entire hillsides throughout the South. Japanese honeysuckle, introduced by horticulturists for its beauty and fragrance, now is growing wild in bottomlands, displacing native wildflowers.

Exotic plants or animals often outcompete native species because they have no competition or because they've left their natural enemies behind. This is especially evident in plant communities where populations of each plant are normally controlled by a host of insects, diseases, nematodes and mites. An exotic plant, lacking these controls, has a free rein to swamp the new habitat and displace many of the native species.

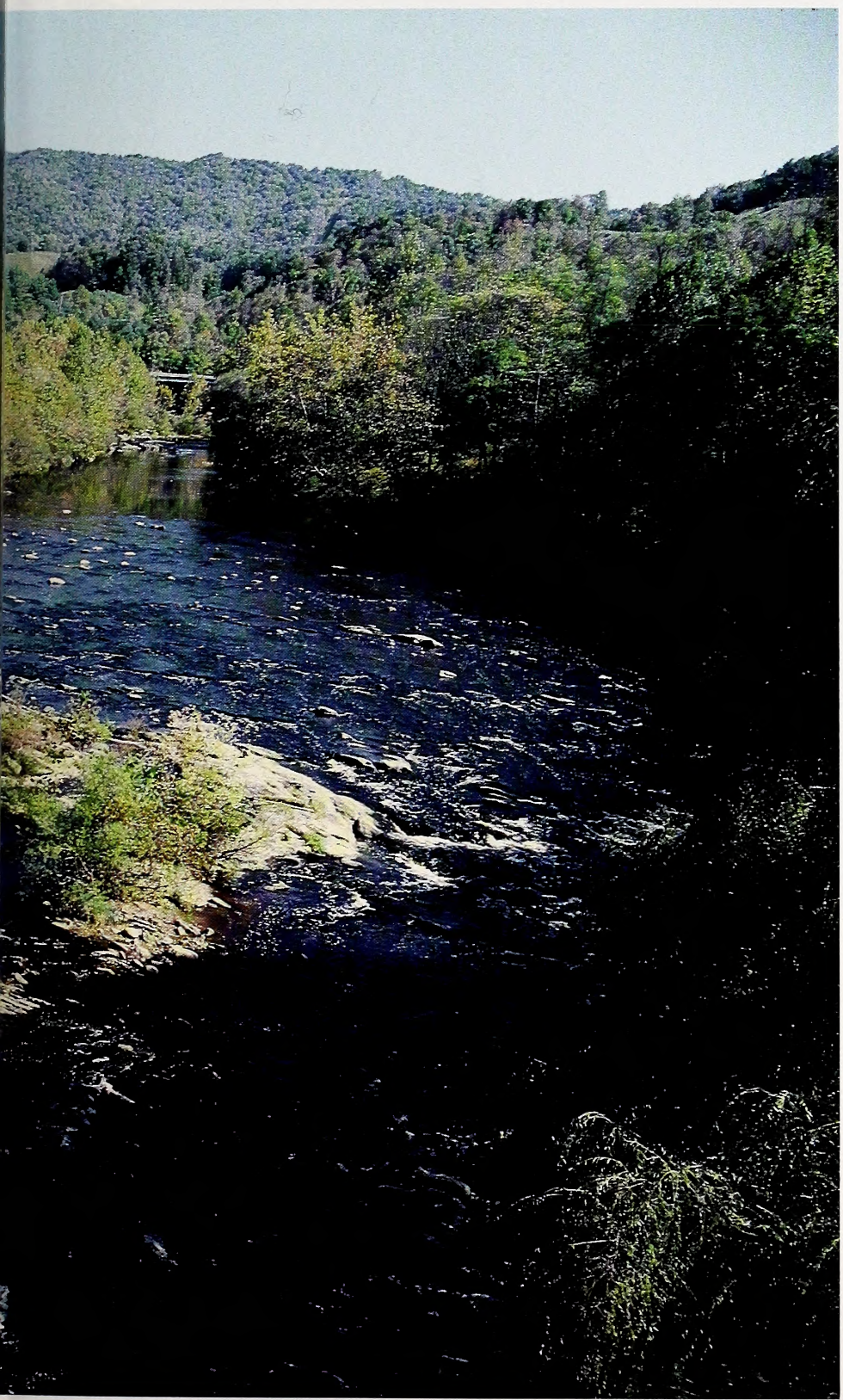
To bring these alien species under control, many botanists have advised introducing even more aliens—the plants' natural enemies found in their original communities. The exotic alligatorweed, for example, has been brought under control in some areas through the introduction of its predatory insects. Yet even seemingly benign exotics may be unpredictable in their effects on the communities in which they are introduced.

Natural ecosystems do not consist of static communities where nothing ever changes. Most scientists say that the composition of our native ecosystems changes naturally through time. Yet these changes have most often been slow, allowing many species to make necessary adjustments to survive. Human introductions have speeded up the process and the result has often been to reduce the diversity of our native plants and animals.

# New Hope for the

# Pigeon

The Pigeon River below Champion Paper may never be pristine, but a cleanup and a proposed diversion of Cataloochee Creek could boost local economies with whitewater sports and better fishing.



written by John Manuel ©1991
photographed by Ken Taylor

No other river in the Southeast has a worse reputation than the Pigeon. The 35-mile stretch from Canton, N.C., to the Tennessee state line has been called one of the most polluted in the country. Arguments over whether or not Champion International, the primary polluter of the Pigeon, can afford to clean up its act have pitted citizen against citizen, state against state. The battle has raged for 10 years, amd may continue for several years to come. But amidst all the angry rhetoric, I have begun to hear words of hope—commitments by Champion to modernize its plant, studies pointing to improved health of the river's fish. And there are other voices, too. They speak of the possibility of "rewatering" the so-called dry gorge of the Pigeon, and turning the lower reaches of the river into a white-water paradise. I decided to listen to all of these voices, and report back my findings.

***"Dad! Dad! I found gold*** in the river. Look, it's really gold."

My 7-year-old son comes running along the bank to where I sit with a blade of grass in my mouth. He proffers a rock the size of a golfball. It's covered on one side with a clear, flakey mineral.

"That's not gold, Jackson. That's mica. It's not as valuable as gold, but it's still a good find."

"It is, too, gold," he shouts. "You just don't know it."

Having registered his protest, Jackson runs back upstream. When I look again, he is back in the water turning over rocks.

I spit out my blade of grass, stand and stretch. Across the stream, a golden meadow splashed with red—clumps of blueberry bushes in their fall splendor—sweeps upward

***For much of its*** *38-mile run between Canton and the North Carolina, Tennessee state line, the Pigeon River has always been a handsome stretch of water, except for the water itself. Though you can see tea-stained discoloration from the paper mill, cleanup efforts will improve water clarity under the new standards.*

to the summit of Graveyard Ridge. The ridge parallels the stream to the base of Black Balsam Knob, a massive, treeless mountain, resplendent in morning sunlight. I can just make out a group of backpackers moving along the crest, headed north toward Shining Rock Wilderness.

Here, in the headwaters of the Pigeon River, man and nature have found a happy medium. The Blue Ridge Parkway skirts the hillside to the west, largely out of sight and hearing. Brightly colored tents dot the meadow beside the stream. Their breakfast campfires send plumes of smoke toward the cloudless sky. Judging by the maze of narrow trails crisscrossing the meadow, I guess the deer population must be large. They will be out tonight while we are fast asleep.

The Pigeon itself runs clear and clean. I have swum in the deep pools a few miles downstream; and though I'll not see any while my son is around, I'm told the headwaters support a good population of native brook trout, locally called speckled trout. Whenever I get discouraged about the Pigeon, when I hear about the deformed fish, the discolored water, and the foul smell of the lower reaches, I try to remember that this is where it all begins. As with a good kid that's gotten into trouble, I like to think it can be saved by its upbringing.

***Driving along the Pigeon*** just south of Canton, the smell of rotten eggs hits me through the open car window. There is little to compare to the odor of a pulp and paper mill—it seems to permeate the deepest recesses of one's nasal passages. But to people in this part of the state, it is the smell of money.

Sprawled across 190 acres in the middle of downtown Canton, the Champion Paper Mill dwarfs everything around it. The mill is the state's largest private employer west of Charlotte. It produces one-quarter of the nation's envelope paper and one-third of the paperboard used in milk and juice cartons. It is also, by Champion's own admission, too large for the river it resides on.

At present, the Champion mill draws approximately 45 million gallons of water a day from the Pigeon River. The seasonal flow of the river at Canton varies from 300 million gallons per day in spring flood to less than 30 million gallons per day during periods of drought. During the latter times, virtually the entire flow is being run through the plant.

The import of this becomes evident as I drive to the northern end of the plant. Where the river just upstream was a murky blue-green, what emerges below the plant is very nearly black—discolored by tanins removed from the wood pulp during the bleaching process. Water in this color range (150-2,000 color units) cuts off sunlight to the river bottom and prohibits the growth of microorganisms necessary to support the normal range of aquatic life. Those fish that have been found below the plant are frequently deformed, and their flesh often tainted with carcinogenic dioxin—another by-product of pulp and paper manufacturing.

In 1989, the Environmental Protection Agency issued Champion a wastewater discharge permit that requires it to raise the color of its effluent to meet a monthly average of 50 color units (the approximate color of ginger ale) as measured at the Tennessee state line—38 miles downstream. Champion has pledged to meet this and other conditions of the permit by implementing a $250 million plant modernization program.

Scheduled for completion in 1993, the modernization program is now well underway. Enhanced water recycling systems are being installed. Two of the three existing bleaching lines are being eliminated. A third is being refurbished and an entirely new line constructed. The use of chlorine, known to form dioxin in combination with organic molecules in the wood pulp, is being reduced through several methods. Chlorine bleaching systems will be replaced by state-of-the-art oxygen delignification. Where chlorine products must be used, they are being replaced with chlorine dioxide that does not react to form dioxin. (This has already reduced the level of dioxin in Champion's effluent to non-measurable levels.) Last but not least, Champion will reduce the noxious odor in the water and air by incinerating the non-condensible gases.

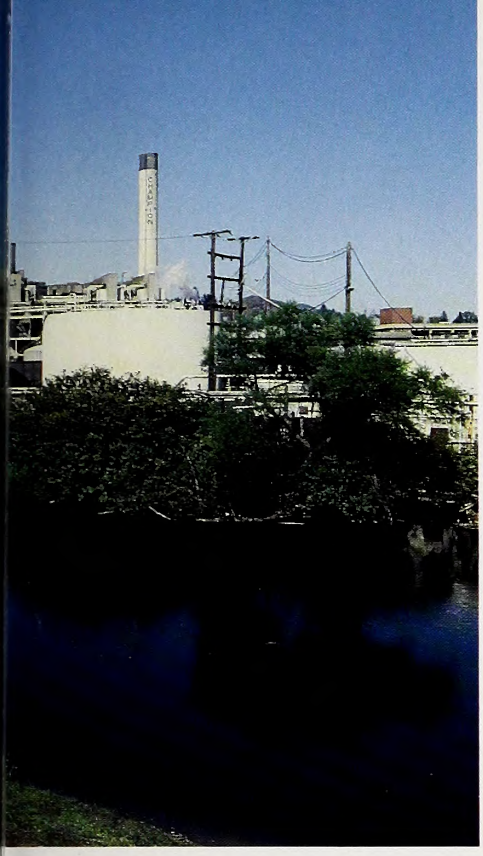
Critics contend the modernization will not be sufficient to make the Pigeon River below Canton the commercial and recreational draw that it should be. "We don't go for this monthly average of 50 color units measured at the state line," says Nelson Ross of the Dead Pigeon River Council. "What if you come up from Raleigh to go boating and the river's up around 80 or 100 units that day? You're going to go somewhere else."

The DPRC has filed suit against EPA in federal district court, contending that the color limit should be a constant 50 units measured at the point of discharge, not 38 miles downstream. That case is currently awaiting trail in Atlanta.

Meanwhile, the states of Tennessee and North Carolina are taking a wait-and-see attitude with respect to what the plant improvements will mean.

"The color of the water, at least at the state line, should improve immediately after the plant improvements come on line," says Forest Westall, regional water quality supervisor for the N.C. Division of Environmental Management of the Department of Environment, Health, and Natural Resources. "Combined with the other measures being taken by Champion—reductions in effluent temperature, biotic oxygen demand (B.O.D.) and dissolved solids—the ecology of the river should improve. But that may not show up for some years after the permit takes effect."

While anticipating improvements, Westall concedes that the 38 miles of Pigeon River from Canton to the Tennessee state line will never equal the quality of water found up-



***The Pigeon River** runs through Canton and the huge Champion facility. Everyone agrees the river is too small for such use, and at periods of low flow in summer, virtually the entire river passes through the plant. Still, new standards and extensive changes at the paper mill show promise for a cleaner, clearer river. Dioxin has also been greatly reduced.*

stream from the mill. This includes 340-acre Walters Lake (also known as Waterville Reservoir), which dams up the Pigeon River 23 miles downstream from Canton. The lake was constructed in 1929 to supply water to Carolina Power and Light Company's Walters hydroelectric plant. Although designed for water storage, Walters Lake also functions as a settling basin for polluted sediment coming from upstream. That is bad for the lake, but may be a blessing in disguise for the downstream portions of the Pigeon.

***Below the dam*** at Walters Lake, also known as Waterville Reservoir, the Pigeon runs through a deep gorge paralleling Interstate 40. Lake water is channeled past the gorge via a tunnel that runs 12 miles through the mountains to the powerplant downstream. That has left the gorge high and dry for the first few miles, although it gradually picks up water from the small tributaries flowing down mountainsides. Hemmed in by I-40 on one side and the steep mountain slopes on the other, the gorge is virtually inaccessible.

That, combined with doubts about water flow and quality, has caused this section of the Pigeon to be ignored by the state's recreational community for the past 60 years. However, state wildlife officials claim the bypassed stretch supports healthy populations of bass and bream. And if the state has its way, it may soon support more than that.

In 1976, CP&L's license to operate the Walters hydroelectric plant expired. The company filed for relicensing in 1973 with the Federal Energy Regulatory Commission. Shortly afterwards, the rival N.C. Electric Membership Cooperative also filed for the license to run the plant. FERC held off considering the licensing issue pending the resolution of an antitrust suit between CP&L and NCEMC. In the mean time, Congress passed the Electric Consumer's Protection Act, which requires FERC to consider wildlife and recreational concerns equally with power production in granting licenses to operate electric power plants. That law has opened the door to a host of proposals with profound wildlife and recreational implications.

In Dec. 1990, the State of North Carolina filed testimony with FERC saying it wants to see the dry gorge of the Pigeon rewatered. Rather than using potentially polluted water from Walters Lake, the state wants the licensee to divert water from pristine Cataloochee Creek, which empties into Walters Lake just above the dam.

"Our proposal is to pipe 40 cfs [cubic feet per second] of Cataloochee water through Walters Lake directly into the gorge," says Steve Reid of the N.C. Division of Water

***Pollution in Waterville Reservoir** on the Pigeon River downstream from Canton will be less severe with the current cleanup, but that will not resolve the problem of low water in the gorge below the dam. One proposal would pipe the pristine waters of Cataloochee Creek—seen entering the lake just above the dam—through the dam and into the gorge below. This could greatly improve the flow and quality of water in the Pigeon through the gorge. Indeed, the gorge could become a superb place for fishing and whitewater canoeing.*

Resources. "That would ensure water quality suitable for trout and smallmouth bass."

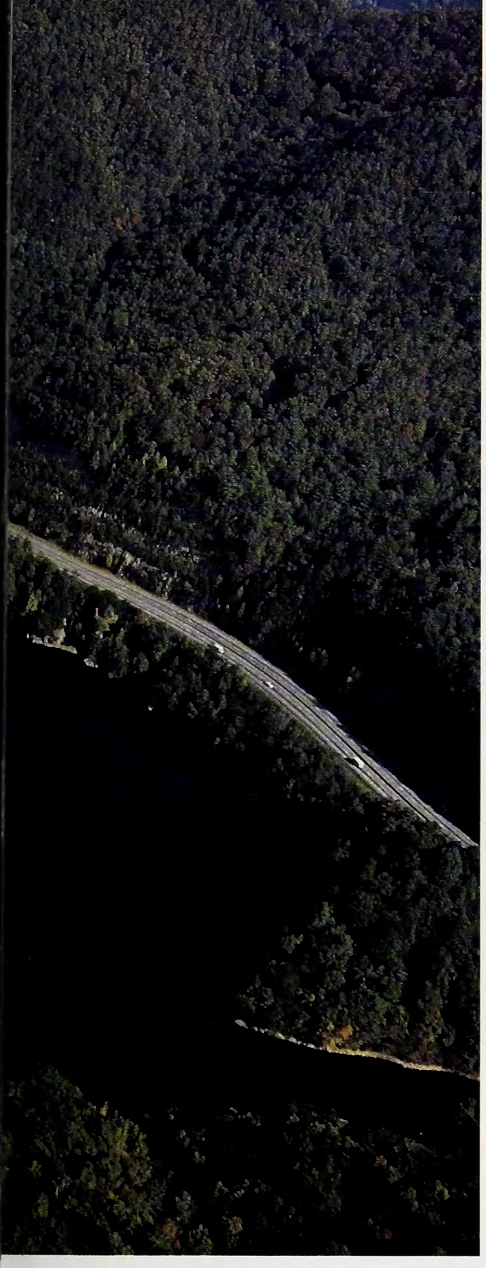
In its application for a license, the N.C. Electric Membership Cooperative proposes to construct the Cataloochee diversion. CP&L has opposed the diversion on the grounds that it would be too costly to build and to maintain. (Cost estimates for the Cataloochee diversion range from $16 million to $24 million.) Instead, CP&L proposes to make in-stream releases from Walters Lake into the gorge, when the water quality of the Pigeon improves. Currently, CP&L is conducting a study to determine what effect various levels of releases would have on the ecology of the by-pass.

The possibility that the by-passed section of the Pigeon could emerge as a trout and bass fishery is highly intriguing. But the competition to win the license for the Walters plant promises even more.

For a distance of 4½ miles below the Walters powerplant, the Pigeon River drops nearly 80 feet. When two or more of the floodgates at the plant are opened, the river downstream turns into an unbroken succession of Class III-IV whitewater rapids. For another six miles beyond, the river contains numerous ledges in the Class I-II range, ideal for beginning and intermediate canoeists.

Two factors have so far kept this stretch of the Pigeon from becoming a whitewater paradise—the water quality and the unpredictability of the riverflow. CP&L operates Walters as a peak power plant, opening the floodgates only when the demand for electricity exceeds the capacity of its baseload plants. This frequently occurs during midsummer days. But the company follows no strict regimen for operating the Walters plant, and paddlers are understandably unwilling to drive any distance to potentially find the river dry.

Several commercial rafting operations, including the Nantahala Outdoor Center, have submitted letters to FERC requesting that the licensee conduct regular, scheduled releases from the Walters plant to encourage commercial rafting operations on the Pigeon. Unofficially, both CP&L and NCEMC have agreed to do this, although they differ on the



timing and the duration of any water releases. According to Kathryn Cooper of the N.C. Attorney General's Office, NCEMC proposes releases four days a week from 10 a.m. to 6 p.m., to include weekends. CP&L proposes releases three days a week from 2 p.m. to 6 p.m. and only during the week.

At present, FERC has yet to award a license for the Walters plant, although CP&L continues to operate it under a temporary permit. Officials won't predict when the procedure will be resolved, but at least one outfitter involved in the negotiations ventures that in a few short years, commercial rafting will be a regular feature on the lower Pigeon.

"I think this could be another Ocoee River," says Andy McKinnon, owner of Pigeon River Outfitters, referring to the dam-controlled river in southeastern Tennessee popular with whitewater rafters and kayakers. "One hundred and eighty thousand paying customers went down that river last year. high number of cancer deaths among its male population. Much of the citizenry suspects that water-borne dioxins emanating from the whole summer. Still, scheduled releases on this section of the Pigeon could be an economic boon for the whole area."

***McKinnon's enthusiasm*** is contagious. With the weatherman calling for 90 degree temperatures the following day, I assume that the Walters plant will be up and running. I strap the canoe on the roof of my car and head for the Pigeon River.

As I traverse the 260 miles from Durham to the Waterville exit on I-40, a host of questions cross my mind. How does the whitewater on the Pigeon compare with rivers like the Nantahala and the French Broad? Aside from McKinnon, I know of only one person who has ever canoed this stretch of water—Bob Benner, author of *Carolina Whitewater*—and it has been 10 years for him. Benner has agreed to drive up from Morganton to join me on the river. I am curious, too, how the presence of I-40, which parallels the river through the gorge, affects the view and the noise. And how offensive is the color and smell 38 miles below the Champion mill?

I find Benner standing at the river's edge just below the power plant. We exchange handshakes and talk excitedly about the river. Benner points out that two out of three turbines are in operation, releasing more than enough water to get us over the rocks downstream. The water is the color of iced tea—not pretty, but considerably better than what I've seen upstream. There is a detectable odor, but it, too, is not severe, and Benner says it becomes largely unnoticeable after we've been "immersed" in it for awhile.

"Well, let's do it!" I say.

We drag our canoes down the steep bank, snap on helmets and life vests, and settle into our straps. As Benner turns his canoe into the current, the river pulls hard at the hull, causing it to tip precariously. "Look out," he shouts over his shoulder. "This river's got a lot of power."

My heart jumps as my boat, too, is grabbed by the current. A hard brace on the downstream side keeps it level. Then we're off.

For the first mile, the whitewater is almost continuous. The river surges around boulders and through constricted passages. We plunge through one drop only to confront another. At the bottom of an S-shaped rapid, Benner eddies out behind a rock. He waves me toward a chute on the far side of the river, his gray-bearded jaw taut with worry. I paddle furiously to make the chute, burst through the standing wave at the bottom, and let loose a rebel yell. Benner's grimace flowers into a grin.

In the second mile, the river straightens out, affording magnificent views of mountain ridges in the near distance. You won't get these vistas in a narrow gorge like the Nantahala. Along the banks, dense stands of sycamore and ash block the view of I-40. The highway is rarely more than a stone's throw away, but with the exception of a brief open stretch near the Walters plant, one sees only quick flashes of trucks whizzing by. Surprisingly, I have not noticed any highway noise either. The whoosh of passing vehicles is lost in the rush of water over rock.

At the bottom of a long, white-stepped staircase, the river turns and narrows again. Four Class III rapids hit us in quick succession—Roller Coaster, Razor Blade, After Shave, and the S-Turns. Benner maneuvers through each with a veteran's touch, avoiding banks and boulders with a few firm strokes.

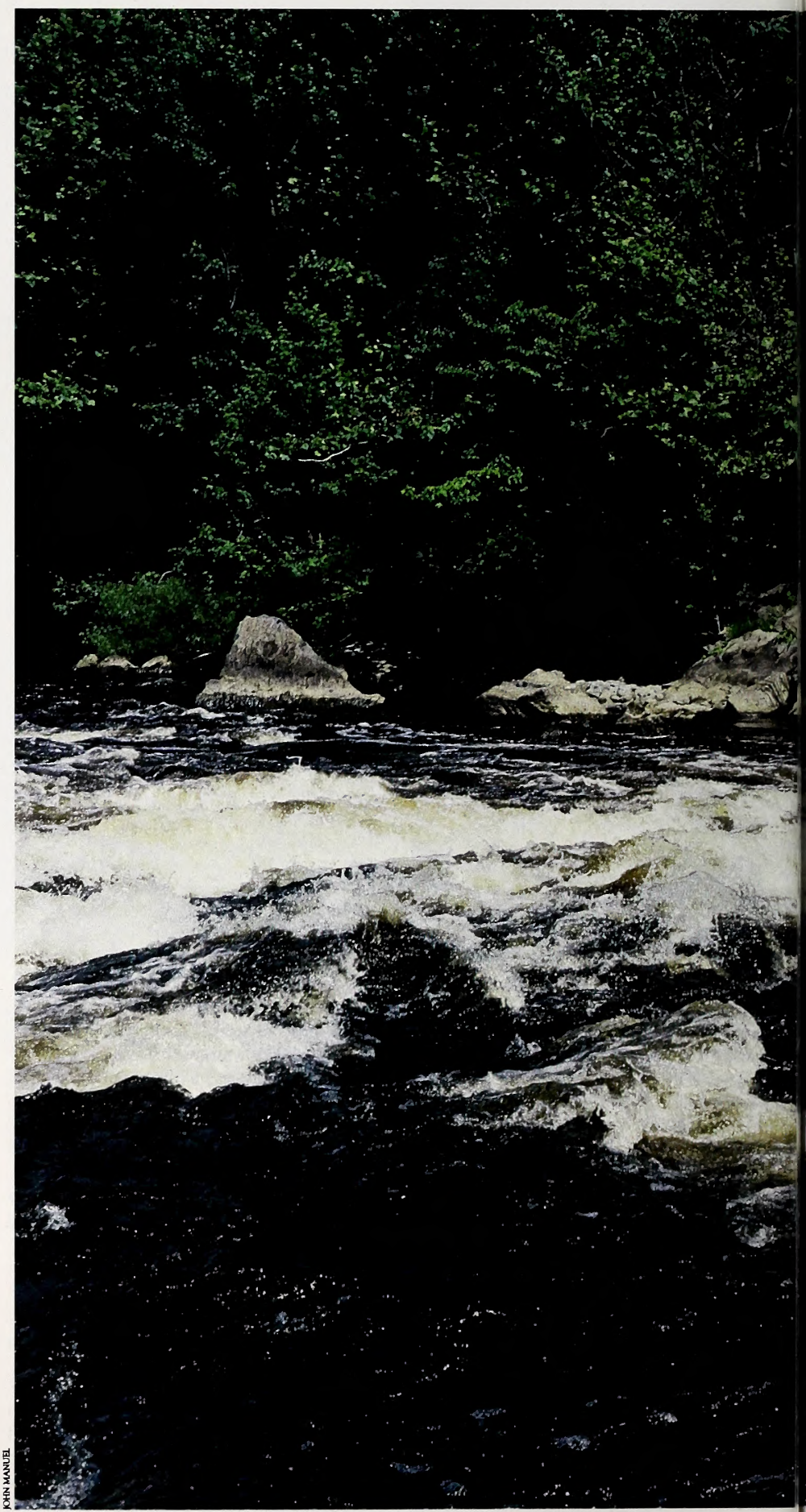
Entering the third mile, we come to the toughest rapid on this stretch of river—a long, Class IV called Lost Guide. A wall of rocks resembling a broken-down dam arches across the left-hand side of the river, forcing the current hard against the right bank. For a good 100 yards, we struggle to keep our boats in line through 2- and 3-foot standing waves. Then comes the final challenge—a heart-stopping plunge between two car-sized boulders. One behind the other, our bows disappear into the final wave, then bob safely to the surface. In the swirling pool at the bottom of the rapid, we circle our canoes into a protective eddy.

"This is great!" I shout. "I can't believe more people don't know about this."

"If they'd run scheduled releases at Walters, people would definitely come," says Benner. "We really need another dam-controlled run in this part of the state. The Nantahala and the Ocoee are the only whitewater rivers that are runnable throughout the summer, and they are really getting crowded."

After resting awhile in the sun, we tackle the 2-mile run down to the bridge at the town of Hartford. There are a half-dozen more rapids in the Class III range. Then the river begins to flatten out. Signs of civilization appear on the bank—a riverside garden, an unpainted barn, and finally, the concrete bridge. We beach our canoes in the shadow of the span and scale the river bank.

***There is not much*** in the town of Hartford. Despite having an exit onto I-40 100 yards away, its only commercial buildings are a post office and a general store. Benner and I walk into the store and pick out candy bars and sodas. The pale-faced woman behind the counter accepts our change without comment. I wonder if she is among those who have lost a relative to cancer. Hartford has earned the nickname "Widowville" for the



JOHN MANUEL

***Bob Benner runs** the Pigeon River gorge below Waterville Reservoir during power generation when the river is up. If such higher water levels can be stabilized, and the cleanup proves successful, this could become a fine stretch for fishing and whitewater canoeing and rafting. If so, the river would also become a significant asset to the local economy.*

Waterville Reservoir is not as big as the one that feeds the Ocoee, so you couldn't get the same volume or longevity of releases over the Champion mill are somehow responsible for the high cancer rate. Public health officials doubt that, pointing out that drinking water comes from private wells uphill from the river.

Champion no longer discharges measurable levels of dioxin into the Pigeon. But having lived with a polluted resource for 80 years, the citizens of this area must be hard put to trust the company or the river.

As we stand outside scanning the open ground between the river and the interstate, Benner and I discuss how this would be a great location for a whitewater recreation complex like the Nantahala Outdoor Center. That operation generated $7 million in revenues last year. A fraction of that income could turn Hartford's fortunes around.

We push our canoes back into the river and paddle to midstream. The current is still swift, but the drops are less severe. The mountains that towered over the river upstream begin to dwindle, and the river widens out. I take off my helmet and open my life jacket to let the sun warm my chest.

For the next 4 miles, the river drops in gradual stairsteps. Ledges, no more than a foot tall, cross from bank to bank every 100 yards. Below each ledge, there is a "curler" where the water turns back on itself. I have been too concerned with getting down the river safely to play in any of the rapids, but now I change my mind. As the nose of my canoe drops over the next ledge, I backpaddle hard to one side, swinging the canoe sideways into the trough. The current tugs hard on the upstream side, but by leaning downstream, I can hold the canoe in equilibrium.

For several minutes I hang suspended, the rush of water sending a gentle vibration through the canoe. Upstream, the river sweeps back to a confluence of green ridges. Framed in the middle is 5,000-foot Mount Cammerer and a blue sky brushed with white cirrus clouds. I find myself thinking that in a few years, my son could join me on this stretch of river. By then, the water could be running clear and the smell of wood pulp gone. God willing, he might know the Pigeon as something beautiful. ☒

# Boning Up On Shorebirds

A field course on North Carolina's colony-nesting waterbirds is helping enforcement officers protect these vulnerable species.

written and photographed by Lawrence S. Earley

When you approach a nesting colony of royal terns, the birds hurtle into the air, shrieking with all the high-pitched gusto of a coliseum full of cheerleaders. The terns are excited and they show it by defecating as they fly. On this island, on this June day, thousands of royal terns and smaller sandwich terns are accompanied by a few brutish Caspian terns, about as big as a red-tailed hawk and twice as aggressive. These aerial bullies float lethally close with their gaping orange beaks before pulling away. It's difficult to keep your eyes on a single bird—the whole mass seems to heave like a heavy sea, confusing to a would-be predator. On the sand beneath the aerial exodus, you can barely make out the spotted eggs and even a few bewildered-looking chicks.

Or maybe I'm the one who's bewildered? Tom Quay is laughing at me. "Look at him! He's never seen anything like this before! Hardly anyone has. It's incredible, isn't it?" I nod dumbly at the din and the air show.

On a bare, sandy island in Wanchese Channel, north of Oregon Inlet, 12 of us, wet and muddy pants legs rolled, field guides clutched in our hands, are witnessing an annual spectacle that rivals anything else in nature. Thousands of terns, gulls and other waterbirds flock to coastal islands each year to nest in large colonies, often laying their eggs directly onto the bare sand and relying on sheer numbers for protection. Tom had told us the day before, "You don't have to go to the Camargue, to Antarctica or to Brazil to see wildlife spectacles. We have some of the most spectacular sights right here in North Carolina." I believe him.

Because the birds are protected by state and federal laws, since 1988 the N.C. Wildlife Resources Commission has been providing its coastal enforcement officers with on-site training in bird identification, nesting habits and distribution. Most of the group are wild-

***Royal terns and chicks** mass in huge concentrations during nesting season (left). This colony-loving bird is among the many species that assemble in spectacular groups on coastal islands in spring. Professor Tom Quay (right) laughs as pelican chick he holds regurgitates a small fish.*

KEN TAYLOR

***Cattle egret pair*** *nests in a heron rookery on a spoil island north of Oregon Inlet. Originally native to Africa, cattle egrets migrated first to Surinam and then north. Several gull species are extending their ranges southward each year as well.*

life enforcement officers taking part in a three-day field course on the 25 species of waterbirds that nest on North Carolina's beaches and coastal islands.

The man leading the field courses, "Doc" Quay as he is familiarly known, is a professor emeritus from N. C. State University and a 45-year student of these birds. White-whiskered and vigorous at 77, he's perhaps better known to a younger generation of conservationists for his environmental activism. He serves on a citizens' committee advising the six-year, $5 million Albemarle-Pamlico Estuarine Study, a joint effort of state, federal and local interests to manage those troubled waters. He was also one of the first appointed members of the Wildlife Commission's Nongame Advisory Committee and is credited by a former student with being among the chief movers behind the passage of the Nongame and Endangered Species Act in 1986.

In his study at home, Quay talked softly and seemed to feel his age. "I'm getting old," he complained. "All this jumping in and out of boats and going up and down dunes and wading into marshes is tough on a man my age." But in the field he is nervously energetic and loudly enthusiastic. Most of the officers in the group are more familiar with ducks and geese than they are with royal terns and piping plovers. Quay prods them into opening their Peterson field guides. "Look there, you can see how the royal terns have orange beaks and the sandwich terns are smaller and have black beaks."

This island is the second of four that the officers will tour this day. Their visits are brief because the birds may abandon their eggs and chicks while we're there, which can be lethal for them on a hot day. That's the reason why these island are posted during the nesting season. The officers are authorized to issue citations to anyone disturbing the nests. "Ten minutes is about as much time as we've got," Quay says, walking quickly across the sand. "If we move fast and watch out for eggs and chicks, they'll be all right. Every adult knows its young and will return to its nest."

Earlier that day we waded onto an island in Wanchese Channel with the largest colony of brown pelicans in the state. As we strode through the colony, the adults lumbered into the air while featherless chicks about the size of large, plucked turkeys waddled awkwardly

away from us. Quay picked up one of the chicks which immediately disgorged three or four small fish from its capacious gullet. Here and there a young pelican lay dead by its nests, proof of the mortality that inevitably accompanies the nesting stage.

Away from the pelican colony we walked past a group of herring gulls nesting on sand amid grass stalks. The eggs were buff-colored; the chicks, sand-colored with black spots. "Herring gulls are Northern birds that have been expanding their populations south," said Quay, as we watched the tiny chicks huddling at the base of plants. "In 1958, we found the first herring gull nest in North Carolina near Buxton. They used to be here just in the winter and then they'd migrate back north in the spring. But now they've been nesting all the way down to Beaufort."

"Look at that big black-backed gull baby!" he cried suddenly. "It's a big ol' baby!" Black-backed gulls and herring gulls are among several species that are expanding their ranges south.

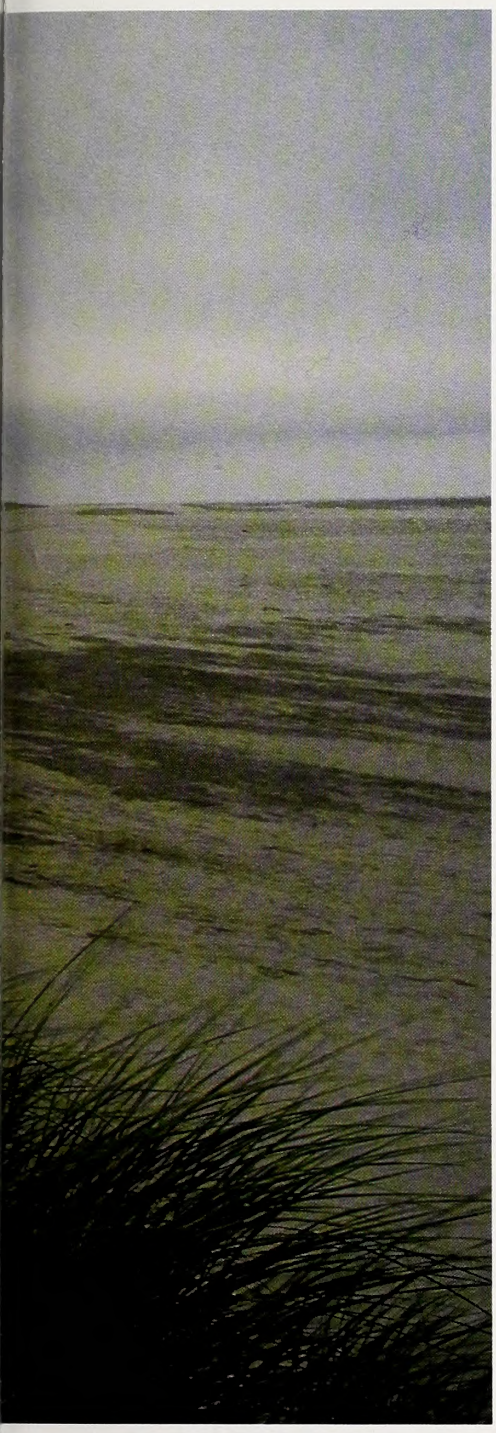
Bird experts like Quay don't know how

***Tom Quay points out** differences between similar-looking terns to a group that includes wildlife enforcement officers and wildlife biologists (above). Field courses like this help coastal enforcement officers learn to protect these birds during the nesting season when the birds are most vulnerable to human disturbance. Dead pelican chick (below) shows that many young birds die of natural causes.*

***Tons of sand** dredged from the Intracoastal Waterway created this large artificial island near Oregon Inlet. Even a newly created island, barren of any plant life, hosts several different kinds of nesting birds that lay their eggs directly on the sand. As vegetation develops on the island, it attracts a variety of other birds.*

to explain this expansion. It's tempting to attribute it to all the new habitat that's been created in North Carolina. "Most of these waterbirds used to nest on the beaches," he said. "Then people came with their activity and their vehicles and the birds couldn't make it on the beaches any longer." This began in the 1920s and 1930s, about the time that the U.S. Army Corps of Engineers began to dredge North Carolina's estuaries, inlets and coastal rivers to create the Intracoastal Waterway. The Corps dumped the dredged sand and shells near the channel and made a series of spoil islands, perfect habitat for the displaced birds. Yet it's more probable that the gull's expansion into North Carolina is due to the growth of food-laden landfills in the North that have triggered a population explosion among these birds. Surplus birds may simply be forced South. Whatever the reason, species never known to have nested here have been moving southward a few miles every year.

There are approximately 600 coastal islands in North Carolina's coastal waters, 400 of which are man-made. It's more accurate to say that these islands provide only *temporary* habitat because they change all the time. Starting out as a dome of sand and shell fragments, the island is gradually colonized



by plants that move up the slopes from the water's edge. In its final stage, the island is covered with a dense maritime shrub forest. The entire successional process can take up to 30 years. According to James Parnell and Robert Soots, pioneers in the study of waterbirds' nesting habitats, each species is adapted to a different stage of the succession. Parnell, of the University of North Carolina at Wilmington, and Soots, formerly of Campbell College and now in the Wetlands Office of the Corps of Engineers, say that a given species nests where it finds appropriate habitat—bare sand, for example, or bits of drifting marsh vegetation at water's edge—and that it may take only a few years for its optimum habitat to disappear.

For example, another island we visit is grown up into early maritime shrub forest. Taking the lead, Quay bushwhacks through head-high thickets of wax myrtle. "This was bare sand 25 years ago when I visited it for the first time," he says. "And it's grown up even since I was here three years ago." Gone are the terns, the gulls, the black skimmers and the laughing gulls. Through binoculars we view the herons, egrets and ibises cohabitating in a rookery in the tallest branches of yaupon and cedar trees. "Look at that!" Tom calls excitedly, pointing to the dark shape of a glossy ibis. "We didn't have glossy ibis or white ibis in North Carolina at one time. Now there are 6,000 nesting pairs of white ibis on Battery Island in the Cape Fear River alone."

Yet, other islands are relatively young with diverse habitats for many different kinds of birds. That afternoon, we wade onto a long, high, sandy island directly in the middle of Oregon Inlet. Only three years old, the island offers a classic demonstration of the way that ground-nesting birds distribute themselves across the landscape. "Look at this," Dr. Quay says as we stop to view a sandy slope ahead. "On the top of the hill where you've got nothing but sand there are royal and least terns. Then on the slope, as you get some low vegetation, you get black skimmers, common terns and gull-billed terns. And down near the water where bits of marsh plants drift ashore, Forster's terns will build their nests. In a high tide, they're easily flooded out."

We walk quickly through the least tern colony—"It's the greatest concentration of least terns in the state," says Quay—frantically scanning the sand to avoid stepping on the tiny eggs and little pieces of downy fluff momentarily abandoned by their parents. One or two of the chicks raise their stubby wings and make a panic-stricken break across the sand. They are gently retrieved and returned to their cluster of siblings. Through my binoculars I see a common tern trying to prod its reluctant offspring to stay put. Or is it just the opposite? "Get moving, slow-poke! Hide here, in this grass!" The white-winged bird dips, hovers and eventually joins the milling, airborne assemblage. I see two chicks huddling beside a rusted fragment of a tin can.

With habitat changing as quickly as it does, especially for the ground-nesting species, it's imperative that some thought be given to where dredged sand is dumped. Dumped in the wrong place at the wrong time, sand could wipe out scarce habitat or even cover entire nests. And in some cases, sand is needed to retard or even reverse succession and create new habitat in places where vegetation has overgrown it. As part of a cooperative effort among 11 state and federal agencies since 1988, the Army Corps of Engineers has been coordinating its dredging to maximize habitat creation and protection. "The Corps of Engineers in this district is the best in the country in paying attention to the ecology of nesting waterbird populations," says Quay. "They're tickled to death about what they're doing! I remember one colonel crowing at a meeting some years ago: 'We're not making spoil dumps. We're creating bird islands!'"

Quay is tickled himself about recent new cooperative efforts that have resulted in the return of nesting birds to the beaches from which they were displaced many years ago. For instance, officials with Cape Hatteras National Seashore have been working with the Buxton Anglers Club to rope off a portion of the beach during nesting season. The endangered piping plover has benefited from this attention, but so have black skimmers and a variety of terns, gulls and some shorebirds. "These birds are returning to the beaches," says Quay. "They will nest even with cars going by. It just shows, they'll return if you protect them. These may be some of the best times for waterbirds."

For the enforcement officers, the days afield were an important step in orienting them to the needs of all wildlife. "The best thing about the course was it gave us the confidence to do our jobs," said Sgt. David Stokes of Currituck. "It's important that we know what birds are protected, what they look like and where they're located. It's a whole lot easier to learn when you're actually out in the field."

To wildlife officer Stephen Jarvis of Kill Devil Hills, the course opened his eyes. "Out here we tend to think a lot about ducks, but most of the time they're not the wildlife that people are disturbing the worst. These waterbirds have enough problems from predators and weather without having to worry about interference from people and their pets while they're nesting." ☐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# Highland Lake Challenge

Mountain lakes offer anglers plenty of variety,
but learning to catch all these species is no mean trick.
One key is to start early.

written and photographed by Joel Arrington ©1991

White serviceberry stood out on the greening hillsides that May years ago at Fontana Lake. We rented a boat and set out full of expectation. With the help of local talent, we tried just about every technique in current use in those days, although we lacked a depth-finder or, in fact, any sophisticated fishing aids.

They weren't necessary at all. We trolled and caught white bass; we cast plugs to shorelines for largemouth and smallmouth bass, and we trolled diving plugs along submerged ridges that extended from gravelly points. Crappie, bluegills and, I think, other panfish yielded to ultra-light tackle. We trolled nightcrawlers behind spinners on the bottom and caught a few walleye, too—in all, seven species of gamefish.

Subsequent trips produced far less because Fontana can be temperamental, but we succeeded that spring because we were willing to try different methods and to seek more than one type of fish.

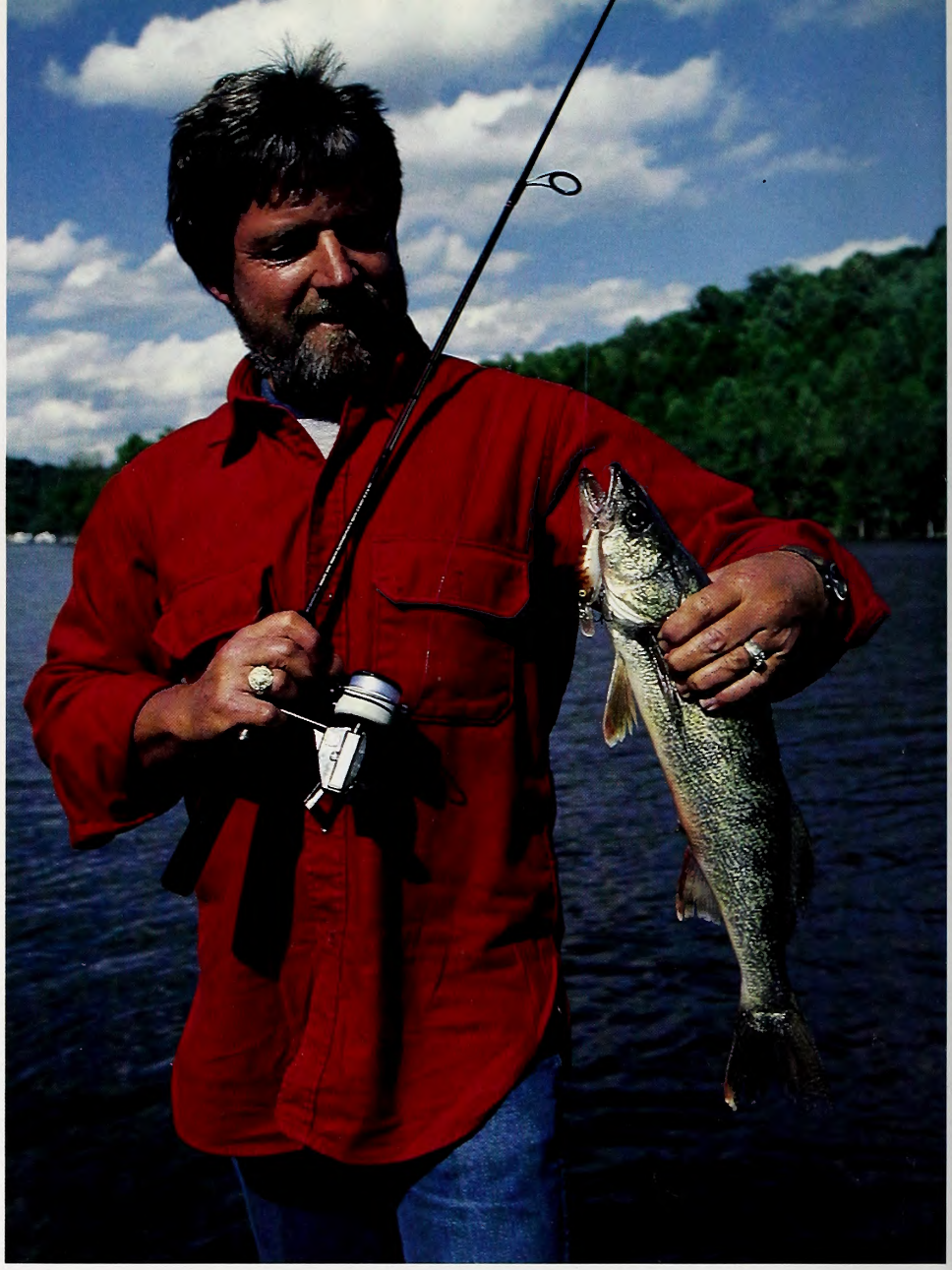
High mountain lakes of the Southern Appalachians like Fontana present a special challenge to anglers. Cold, infertile, often clear, always short of food for gamefish, they nevertheless carry a surprising volume of fish and yield a few big ones every year to the skilled and the lucky. Consequently, they offer exceptional angling to anyone knowledgeable of their particular characteristics and willing to accept the challenge to do what's necessary to catch fish in them.

Three of North America's *Micropterus* species thrive in North Carolina's high mountain reservoirs, including largemouth, smallmouth, and spotted bass. There are also rainbow and brown trout. Walleyes and sauger remain common in some lakes, along with white bass and, in Lake Lure, hybrids of white and striped bass. Various catfishes, some of them monsters, and a conglomeration of panfish abound, including most notably crappies and bluegills. An outstanding fishery for muskellunge has developed in Lake Adger and continues to improve elsewhere. The opportunity presented by all these species at the various seasons in various depths, water temperatures, turbidities and locations excites the angler, but it can also be daunting. How to start?

Perhaps at night. Clear water remains one of the mountain reservoir angler's main problems, causing fish to hold so deeply as to be out of reach in daylight hours, especially on bright days. Fishing under the stars takes some getting used to. Tangled lines, snagged lures and mishaps are routine, but nocturnal fishing has its own charms. Between June and September, it might also present your best chance.

Bass will be close to their daytime stations, moving up, for example, from a deep channel to the nearest shallow cove. Lure options include dark topwater plugs and 1/16 to 3/8-ounce jigs rigged with pork rind or rubber worms in a black-on-black or black-on-brown color scheme. Night fishermen generally shun light-colored lures.

***Fontana Lake** (right) lies along the southern edge of the Great Smoky Mountains National Park, and is one of the best of North Carolina's mountain lakes. White bass (left) grow big in Fontana.*



***Perhaps the biggest** attraction to mountain lake fishing is the wide variety of species that can be caught. Experienced anglers often zero in on walleyes because they're particularly good to eat.*

Noisy topwater attractors can produce violent strikes from bass when cast into shallow, quiet coves on late summer nights. Largemouth bass might move in from deep water as twilight falls and take a station in cover to ambush bait. Cast a popper or chugger, a spinnerbait with oversized blades, or a buzz bait that has been bent so that the blade ticks the shaft. Work these lures slowly, however, because fish locate prey at night by sound, perhaps more than by sight. They need time to home in on your lure.

Jig-and-eels should be cast to sloping banks and allowed to sink, then should be retrieved steadily a few inches off the bottom. This technique is especially effective on smallmouth bass and walleyes. Feed line as necessary to keep the lure deep. Fishing the bottom contour is important. "You've gotta let that jig drop," emphasized Richard Winfree, one of the expert anglers who schooled me on mountain lakes. Erratic retrieves will be counterproductive.

Most of us, however, prefer to do our fishing when we can see better. On most lakes, but especially on clear mountain reservoirs, dawn and dusk offer the prime hours. If a bright day is forecast, savvy anglers should plan to be on the water and casting at least a half hour before the sun comes up. This will almost surely mean a middle-of-the-night alarm and driving to the dock in the dark. Not long after a bright sun gets up, most opportunity has passed. We can try again at sundown, but often we have fished so hard all day when chances of success are low that we are too tired to fish the twilight when we are much more likely to catch a good fish. The last hour of daylight is worth six hours from the middle of the day, and many a big fish has hit on the last cast before the angler planned to head in. For much of the year, anglers should plan to fish twice a day on clear days, at dawn and at dusk, using the middle of the day for something else, or to rest up for the late afternoon. Experienced anglers pack plenty of food.

Mountain lake fishermen love a cloudy day. General overcast without rain is ideal, although we will put up with a downpour if necessary. Only lightning drives stalwarts to shelter. Oh dark days, fish enter clearer and shallower water and remain there longer in the mornings. At these times, everything seems to work better.

Even on clear days, wind can be the angler's ally because wind drives waves against the shore where they might produce a band of muddy water. I remember one spring at Fontana when, as usual, we started too late, missing the good fishing that might have occurred at dawn. We worked Hazel Creek Cove to a froth under building cumulus clouds, but to no effect. By early afternoon, a thunderhead towered behind the encircling peaks and there came a sudden storm with gusty wind. Heading in, drenched, we hit the main body of the lake where wind had been hard against a bank and Luther Turpin, longtime guide and dock manager at Fontana Lake, insisted we stop to cast into the muddy water next to the sloping bank. We threw live salamanders into the yellow mud clouds and smallmouth bass were on them instantly. After catching several bass and a walleye, we switched to lures and caught a few that way, too. Many times since, I have looked for those muddy banks, found them and caught fish, either by casting to them or by trolling a deep-diving plug along them.

Fishing bait schools can be frenzied. A good depth sounder helps anglers find bait or, especially in May and October, you will spot shad wakes on a calm surface or see fish cutting into them. When "fishing the breaks," it's not unusual to find white, largemouth and smallmouth bass around shad schools, as well as spotted bass where they have been stocked, as at Kerr Scott Reservoir. The bait is gizzard or threadfin shad and most often it is suspended between the surface and 50 feet deep. If fish are deep, Richard Winfree might cast a ¼-ounce jig with a 2½-inch to 3-inch curly tail or a slab spoon weighing ⅛th to ½ ounce. He allows a jig to drop at first, just keeping a tight line, then retrieves slowly. If fish show on the surface, he might cast a Rebel Jumping Minnow, a Hellcat or A.C. Shiner and retrieve with greater pace.

Fishing for white bass like this can be

maddening when they just won't bite, but exhilarating when they will. Fontana Reservoir holds some of the biggest white bass anywhere.

Mountain lakes all have the same problem—a shortage of available forage, according to Chris Goudreau, the N.C. Wildlife Resources Commission fishery biologist at Marion. Oh, there's ample bait production, but the native bait, the one resident in the streams and rivers when North Carolina's mountain lakes were impounded, is the gizzard shad. Unfortunately gizzard shad grow too fast to be of much use to most of the gamefish. Once they reach 3 inches, which might be within a year, shad are too big for most gamefish. They also live too long, up to 10 years. Goudreau said that perhaps 40 percent of a lake's productive capacity might be tied up in gizzard shad, but only 5 percent of them might be small enough for gamefish to eat.

Threadfin shad, native to the southern Gulf drainage and Atlantic streams of Georgia and Florida, may be a partial answer. They grow only to 3 inches and therefore remain available as forage for a long time. Threadfin shad were once thought to completely die out over the winter. Programs to stock them have been widespread over the nation, but in the case of North Carolina's mountain reservoirs, at least, they have not been a panacea. Winter mortality needs to be examined more closely, Goudreau said, and dynamics of the relationship between threadfin and gizzard shad, if studied in depth, might give some much-needed answers. The Commission's Division of Boating and Inland Fisheries continues to look at possible solutions to what has been a knotty problem in the west.

Curiously, what you have in a mountain lake with too few bite-size baits is not a stunted population of starving gamefish, but rather a small population of healthy gamefish and a large population of big shad. A bass you might catch out of Fontana or Santeetlah will be filled out, perfectly healthy, and capable of giving a good account of itself on the end of your line. Getting it attached to your line, however, may be a little more difficult here than in a lake down on the Piedmont.

A live bait will help. Live salamanders, crawfish, and minnows are extremely effective baits for bass, walleyes, trout and catfish, but they must be fished deep or under cover of darkness, or in dingy water they like lures. Use #1 to 2/0 weedless hooks and a small split shot, if any weight at all.

Another approach, and a good one, is to troll small deep-diving lures along a steep bluff or gradually sloping bank. You need to go deep, and I've seen people troll 300 feet behind the boat with 8-pound line, but I doubt they get much deeper after paying out the first 100 feet of line, and they can't possibly set the hooks as well that far out because of line stretch. The lure should bump bottom occasionally. Some experts say to troll windy rather than lee shores, expecting fish to be facing into the wind.

***Smallmouth bass** are among the most popular fish in our mountain lakes. Like other fish in these clear, deep reservoirs, bass can be hard to find and catch, but live bait and deep-running crankbaits are often a good bet.*

This technique works well for largemouth, smallmouth and spotted bass, and for rainbow trout, but you can expect anything in the lake to eat a small deep-swimming plug.

Reservoirs are notorious for changing water levels. They have been built for flood control and power generation, so water authorities manage them primarily for those purposes. Rising water sends bass to shallow water; falling water sends them deep. When you first arrive at a lake, your first question should be, "What's the water doing?" That intelligence, as much as anything, will determine how and where you will fish.

Hard and sustained rain may also come into play. Fish have evolved to key on runoff and move toward tributary mouths when the flow increases to catch whatever might be washing down. They tend to move into newly flooded vegetation near shore, but will desert those spots within hours in response to a drop in water level and may become difficult to catch.

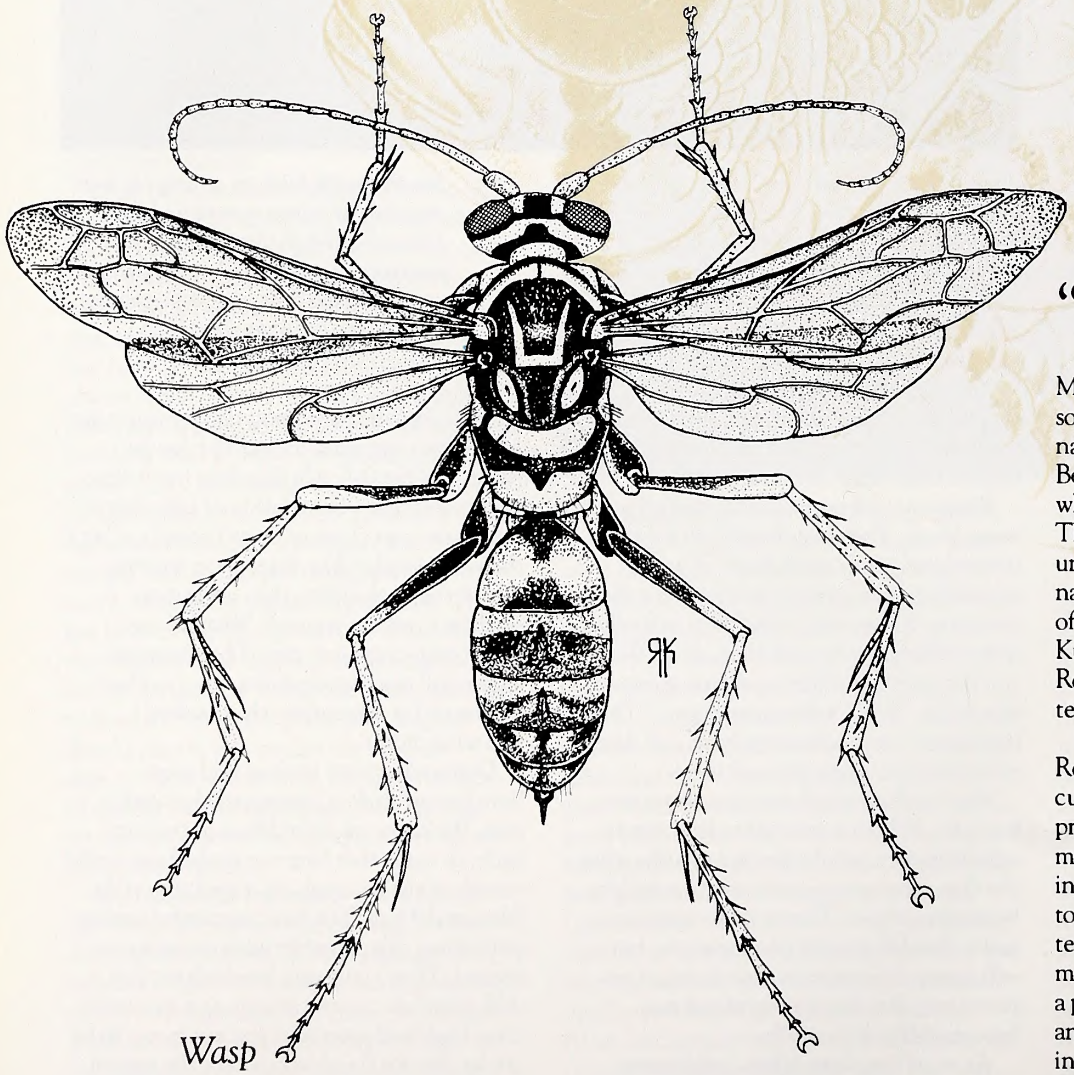
As on all Southern lakes—with some exceptions—fishing is best on mountain reservoirs for a short time in the spring and again in the fall when water temperatures are moderate—between 65 and 78 F for the basses and panfish, a little colder for walleye, musky and trout. Schedule your trips then to maximize your chances. A call ahead to check the water level will be wise; upon arriving, talk to the dock clerks, then get out on the lake to see for yourself. Weather patterns often come into play. The systematic angler will mark successful spots on a chart and record or remember what worked and what didn't.

Doing what your analysis and your hunches say to do is sometimes the hardest part. We know we should have gotten up early, or made that long run in the boat to the mouth of the far creek, or stayed out on the lake until 9 p.m. The most successful anglers put fishing first, comfort and convenience second. That's true on a brackish estuary, a mid-state lake, a trout stream or a mountain lake. Highland reservoirs just ask more of the angler. But for those who accept the special challenge, these clear lakes return more satisfaction, too. ☒

# The Creative World of Renaldo Kuhler

Imagine having to draw the tiny teeth of a shrew. Or the bones of a bat. That's the work—and some say the art—of a scientific illustrator.

written by Mary Clark
illustrated by Renaldo Kuhler ©1991

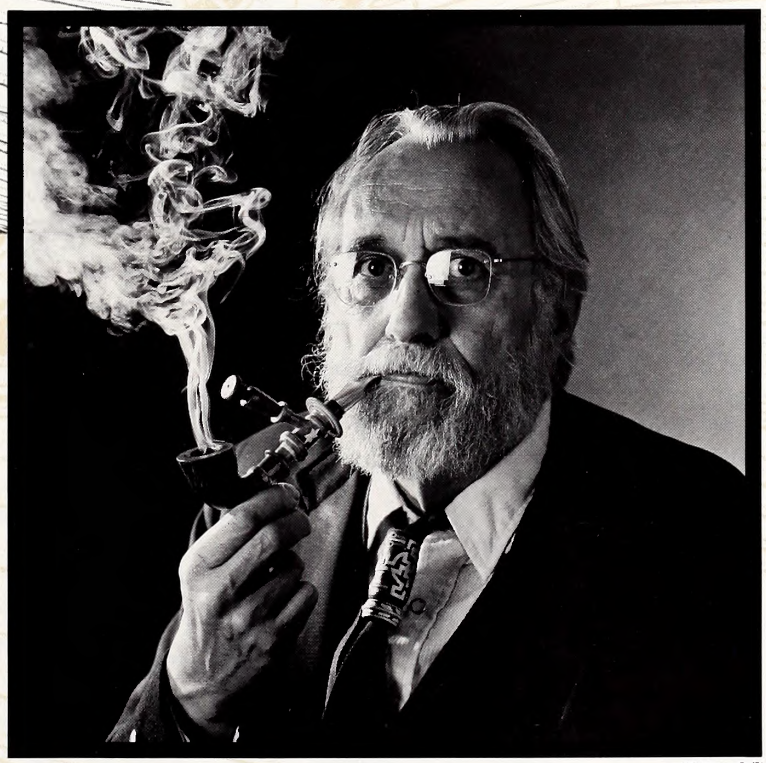


*Wasp*

"What'cha up to, Little Teeth?" During the course of a workday at the N.C. State Museum of Natural Sciences in Raleigh, some co-workers often address me by this name. You may be surprised that Ingrid Bergman, Cleo (short for Cleopatra), Buckwheat Cakes, Bean Salad, The Mexican and The Stove also work in the museum. An unlikely cast of characters to be sure, the names are the products of the creative mind of Pleistocene Man, also known as Renaldo Kuhler, the museum's scientific illustrator. Renaldo's nicknames well illustrate his tendency to indulge in the fanciful.

During my 12-year career at the museum, Renaldo has given me several names. My current name, Little Teeth, reflects the preoccupation of my job. As curator of mammals, I often work with small mammals, and in mammal study, the teeth of a species help to identify it. Renaldo has to draw the little teeth of shrews, moles, bats and other small mammals, which is no small feat. The skull of a pygmy shrew measures about 5/8 of an inch and that of a big brown bat about 3/4 of an inch. Imagine having to draw all 32 of the shrew's tiny teeth, each in excruciating detail and in correct proportion!

*Black-banded sunfish*



MELISSA McGAW

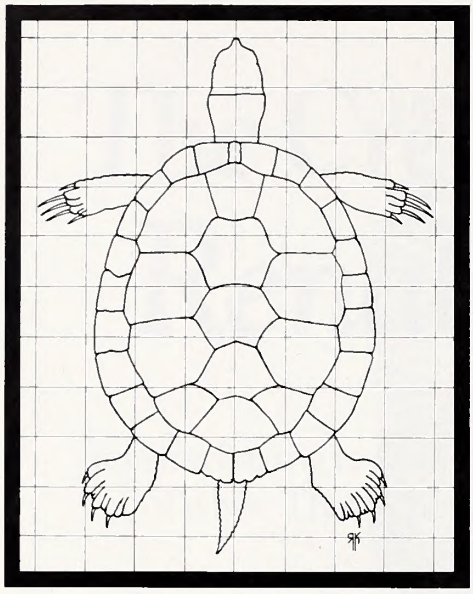
Why not use photographs if accuracy is that important? To answer that, consider the needs of Dr. Rowland Shelly, the museum's curator of invertebrates. Dr. Shelley has identified about 60 new species of millipedes. The only way to distinguish among similar millipedes is to compare their gonopods, the foot-like structures that house a male millipede's reproductive parts. These structures are so small you need a microscope to see them, so they're not easily or economically photographed. A written description may work, but a drawing is the best way to help others understand the structure of the animal and to see the distinguishing details.

Renaldo's career at the museum began in 1969 after receiving a certificate in museum techniques from the University of Colorado. In addition to preparing artwork, he designed exhibits, painted backgrounds and prepared plant materials for display. In 1974, the growing needs of the museum's research curator required him to specialize in scientific illustration, a field in which he is essentially self-taught.

Most of Renaldo's subjects are animals, but his work bears little similarity to that of wildlife artists who prepare paintings for duck stamps or art for the pages of magazines like this one. Renaldo confirms there's a big difference between the work of an artist and a scientific illustrator. "Don't call me an artist," he insists. Both share the goal of producing work that is pleasing to look at, but the wildlife artist generally does not give much attention to the finer anatomical details. In contrast, these subtleties are of greatest concern to a scientific illustrator who must produce a drawing of measured accuracy. Preparing a precise scientific illustration requires frequent consultation with a scientist.

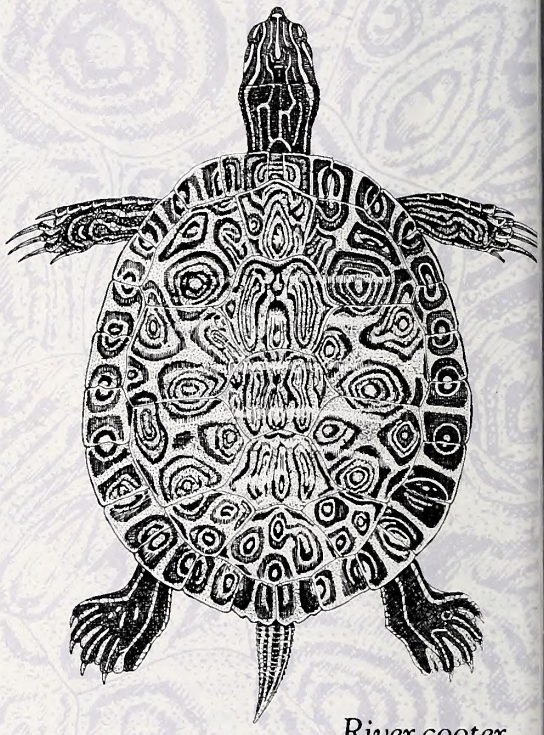
Renaldo must apply discipline to his creativity, including following established standards for each animal group. For example, since skull bones and teeth are the most important identifying characteristics of mammals, it's traditional for scientific illustrators to draw three views of a mammal skull. Showing the shape and arrangement of scales on the head and the patterns on both the belly and the back of snakes are other conventions. Maintaining these traditions permits illustrations to be easily compared and also allows the work of different illustrators to be compared. This ensures that an illustration will be interpreted accurately.

Renaldo starts an illustration by drawing an outline or layout of the organism. This may seem easy, yet it's one of the most important steps. Correctly depicting the size and



# Process

*Scientific illustration begins with a simple outline of the subject. A grid placed over the specimen helped Kuhler attain the correct proportions for his illustration. It also provided him with points of reference as he recreated the pattern that occurs on the shell of this river cooter.*



*River cooter*

proportion of the animal is a critical task of making the drawing accurate. It requires the skillful use of optical instruments and precision measuring devices, some of which Renaldo makes himself.

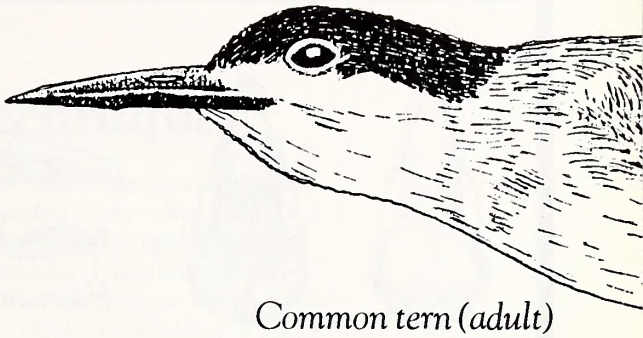
"Layout is the structural skeleton of an illustration," Renaldo says. "As tedious as it may be, it is still the most important part. But the fun begins when you fill in the details. It's like taking a barren island and converting it to a lush green paradise." Conferring with curators, he makes sure that he knows the animal's important characteristics and then he adds the elements that give the subject its characteristic shape—highlights, texture, the angles where different forms join, perspective and foreshortening (an artistic device that gives the illustration a third dimension).

Drawings are generally prepared larger than their final size. When published or used in an exhibit, the illustrations are reduced and the smaller image often appears sharper than the original.

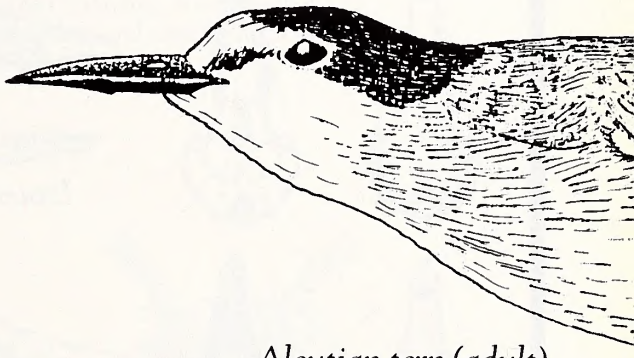
Renaldo works mostly in pen and ink. This kind of drawing is pleasing to look at and economical to publish, but considerable skill is required to suggest the animal's three-dimensionality. Tone and texture are created by the use of cross-hatching, stippling and other techniques. Stipples are tiny dots that when placed close together give the impression of dark tones; placed farther apart they give a lighter impression. "It's not easy to suggest the shape or the contour of the animal without detracting from the color pattern or scheme," he says.

Renaldo takes pride "in having the opportunity to use my talents to serve the scientific community." Museum curators are pleased about this, too. The museum has specialists in all the major animal groups so Renaldo is asked to draw a wide variety of subjects. "My job is like going to school and getting paid for it," he says. "This field has taught me a lot about different branches of natural history and it's made me more aware of the diversity of the natural world."

Scientific illustration is both an art and a science. Renaldo Kuhler's illustrations can tell you all you need to know about the cusp pattern on a rodent's molars, but they also stand on their own as beautiful illustrations. Accuracy, readability and beauty are the criteria by which scientific illustrations are judged. A computer just might be able to handle all of these, but it wouldn't address the museum director as Ingrid Bergman. ⊠



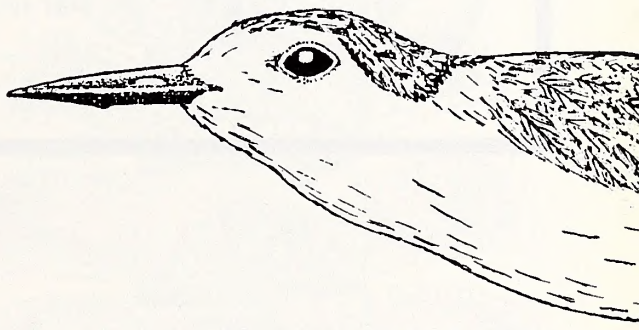
Common tern (*adult*)



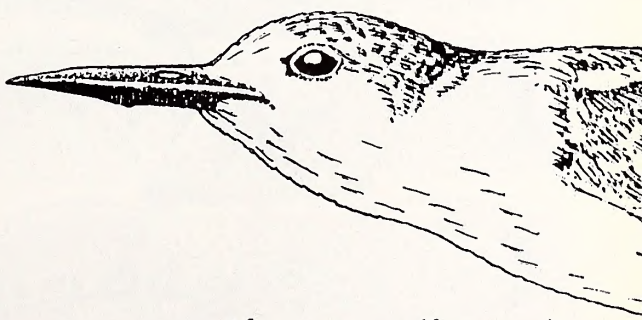
Aleutian tern (*adult*)

# *Function*

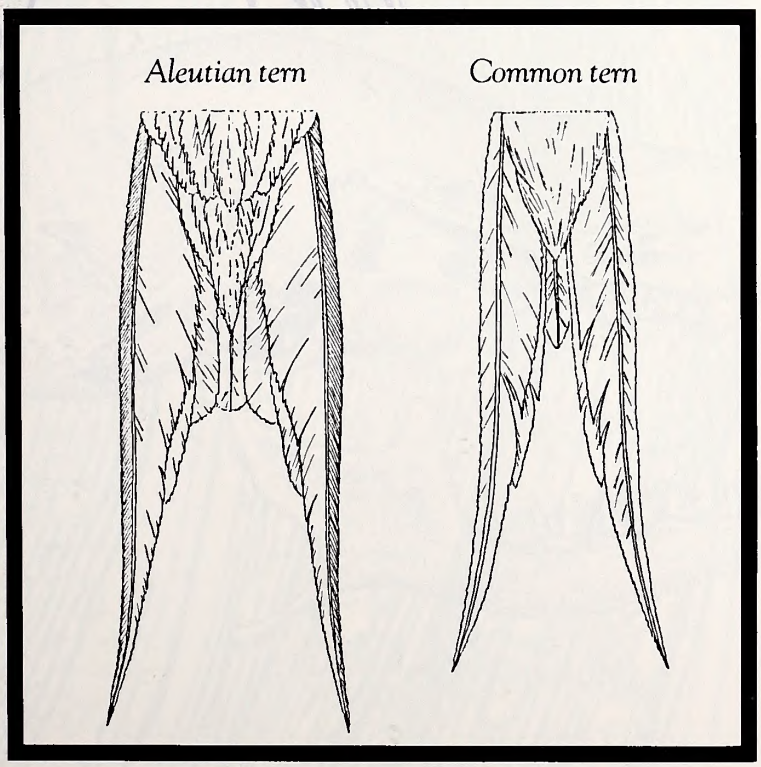
*Both birdwatchers and researchers identify birds by their plumages. But the plumages of many birds change according to season and to age. These illustrations show the plumage changes on the heads and tails of two similar species, the common tern and the Aleutian tern. Subtle differences in the tail feathers also help to distinguish these two species. These details were only recently discovered and described in an ornithological journal. Eventually such characteristics are used in field guides that help others identify birds in the wild.*

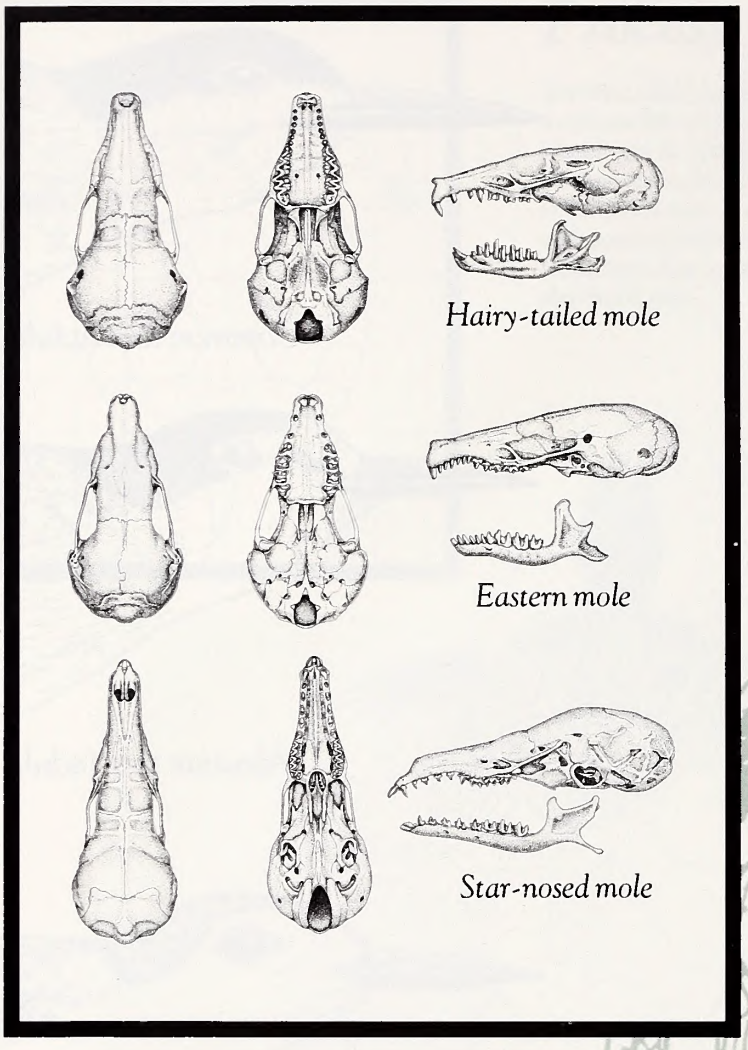


Aleutian tern (*subadult*)



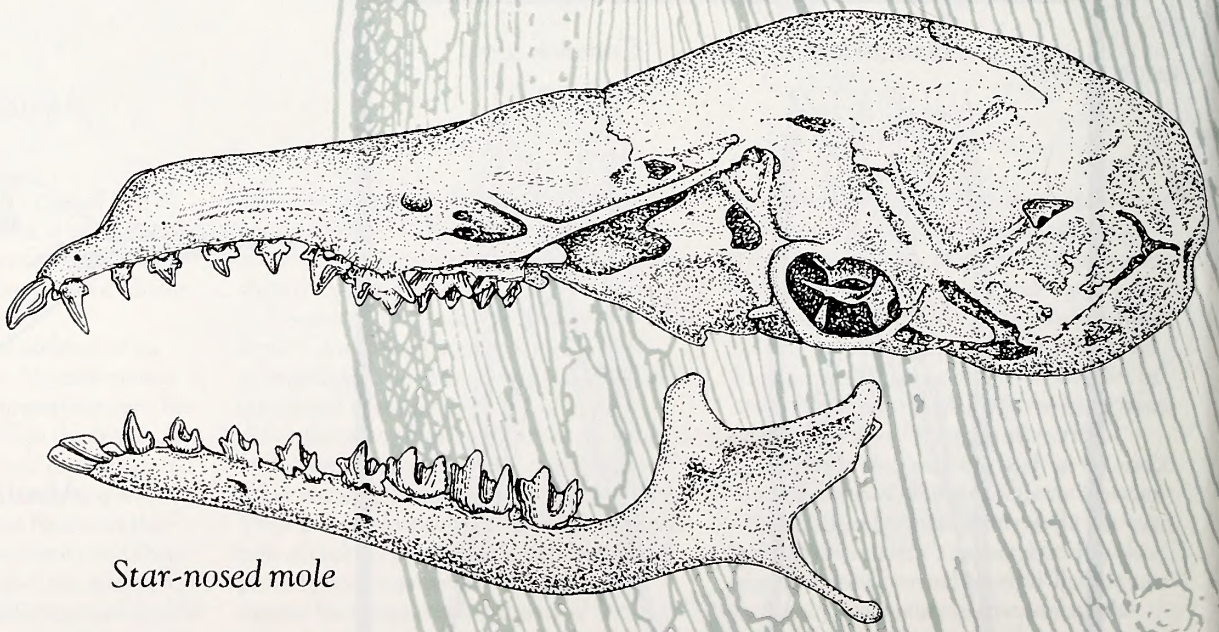
Aleutian tern (*first year*)






# Standards

*To identify and classify mammals, mammalogists have traditionally relied on the characteristics of the teeth, along with the shape and proportions of the skull, as their main tools. At left, the skulls of three moles are compared. From left to right are top, bottom and side views.*



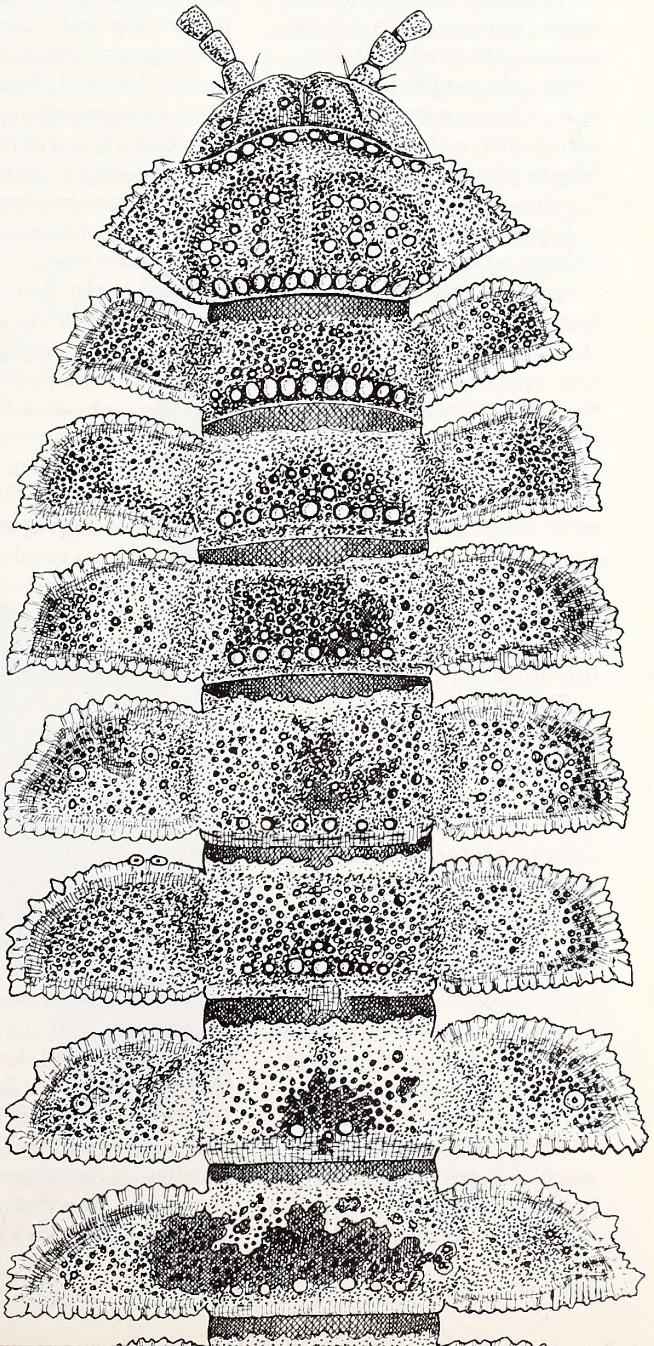
Star-nosed mole

*Florida melampus*

*(detail)*

# *Technique*

*Kuhler's illustrations are composed of the simplest marks—lines and dots, or crosshatching and stipples. A careful examination of these illustrations reveals some techniques that create the detail. Varying the thickness of lines or dots and the spaces between them is one method of shading. A combination of crosshatching and stippling helps to suggest form and texture.*



*Millipede*

*Juniper Populations Much Diminished*

# Weyerhaeuser Plants Atlantic White Cedar at Wildlife Refuge

*Written and Edited by Vic Venters*

Last December, the Weyerhaeuser Company made a gift to the state of North Carolina when it planted, then donated, 12 acres of Atlantic white cedar on the Pocosin Lakes National Wildlife Refuge. While 12 acres seems a tiny amount, Weyerhaeuser's donation could be the beginning of an attempt to reestablish healthy Atlantic white cedar populations in the state. The donation was also in conjunction with Gov. James Martin's Celebration North Carolina Foundation.

In pre-settlement times, Atlantic white cedar forests covered vast stretches of the Eastern Seaboard, with the area that is now coastal North Carolina considered to have some of the highest concentrations of the trees. When settlers arrived in North Carolina, they quickly discovered that Atlantic white cedar, more commonly known as juniper, provided superb housing and boat-building material because it was easily worked but strong, rot resistant and light in weight.

The qualities of its timber, however, have almost proven to be the species' undoing. Because of strong demand and juniper's poor regenerative abilities, the Atlantic white cedar is in danger of disappearing from our state's forest ecosystem.

In 1989, Atlantic white cedar was listed as globally endangered by the Nature Conservancy because it exists only in remnant stands and does not regenerate well. It also continues to be a popular building timber.

At the turn of the century, much of North Carolina's remaining juniper was logged out. The stands that did regenerate were again logged out in the 1950s and most did not regenerate afterwards. In North Carolina, foresters estimate the state has lost well over 90 percent of its junipers and for the most part the tree has been reduced to scattered populations.

Several factors led to this drastic decline. Original juniper forests grew only on specific peat-soil wetland sites that were typically drier than the classic swamp forest yet wetter than pocosin wetlands. Over the past two centuries, much of this land has been ditched, drained and cleared for agricultural purposes. Juniper is also one of the most shade-intolerant species, and does not reproduce beneath its own canopy or that of other swamp forest trees.

To regenerate during pre-settlement times, the species was dependent on catastrophic wildfires—occurring on a 50- to 250-year cycle—to kill and clear existing juniper forests so that seedlings could sprout on the fire-cleared ground. With modern fire suppression and alterations to natural drainage patterns, these unique growing conditions have virtually disappeared.

In the early 1980s, Weyerhaeuser began to plant juniper seedlings on small test sites in the state as part of an experiment. While the seedlings grew well, white-tailed deer quickly destroyed the plots by overgrazing. Without a method of keeping the deer at bay, further reforestation efforts were futile.

The new 12-acre juniper site at Pocosin Lakes, however, is protected by a unique battery- and solar-powered electric fence imported from New Zealand. "It appears to be very effective, but it's rather expensive," said Joe Hughes, an environmental forester for Weyerhaeuser and one of the company's leading juniper experts. In addition to the juniper plot at Pocosin Lakes, Weyerhaeuser has enclosed several other experimental juniper plots with electric fences. Unfortunately, the large scale use of electric fences may be cost-prohibitive.

KEN TAYLOR

***Vanishing Act:*** *Populations of Atlantic white cedar, known locally as juniper, have almost vanished from North Carolina because of heavy demand and poor regeneration. Weyerhaeuser recently planted 12 acres of juniper at Pocosin Lakes National Wildlife Refuge as a gift to North Carolina. Weyerhaeuser foresters hope to learn enough from experimental plantings with seedlings to restore large juniper stands.*

Since 1989, Weyerhaeuser, the N.C. Forest Service and the NCSU Forestry Extension have made experimental plantings comparing juniper rooted cuttings and juniper seedlings. "Rooted cuttings are a low-risk way to ensure success and we're close to having that technology perfected," Hughes said.

If a method can be found to protect the seedlings from deer, commercial juniper plantings could become much more common because demand for the wood remains strong. "We're getting some real good growth rates," explained Hughes. "They may not be as good as we get with loblolly, but they are still relatively high." Hughes estimated that commercially grown juniper might be harvestable in 40 to 60 years.

Successful commercial replantings might also pave the way for replicating the natural juniper forests on the Pocosin Lakes National Wildlife Refuge and other protected areas. "Right now, we don't have a formal reintroduction schedule drawn up, but future plans will include reforesting some of the refuge with juniper," said David Kitts, assistant refuge manager at Pocosin Lakes. "We know the area would be a good site."

*Acquisition Lands Threatened by Urban Sprawl*

## Expansion Proposed for Historic Mackay Island Wildlife Refuge

One of North Carolina's most historic national wildlife refuges may be getting a little badly needed breathing room. As soon as funds become available and final approval is granted, the U.S. Fish and Wildlife Service plans to add 1,440 acres to Mackay Island National Wildlife Refuge in northeastern North Carolina. The lands are being added to the refuge to protect them from encroaching urban sprawl from the nearby city of Virginia Beach.

Of the proposed addition, about 82 percent of the land consists of freshwater marshes, while most of the remainder is forested or agricultural uplands. "This land bordering the refuge is being crowded by heavy residential development coming down from Virginia Beach," said Elizabeth Souheaver, refuge manager for Mackay Island NWR. "The area's waterfowl habitat will likely diminish if the intensity of residential development continues."

Of the land the Service hopes to add, 746 acres will be donated by the Conservation Fund, a private land conservation group, while the Fish and Wildlife Service plans to purchase the remaining 574 acres from nearby landowners.

In 1918, Joseph Knapp, a New York publishing magnate, purchased Mackay Island for his private waterfowl hunting lodge. Knapp is regarded as one of the founding fathers of Ducks Unlimited. In 1930, Knapp founded the More Game Birds in America Foundation at Mackay Island.

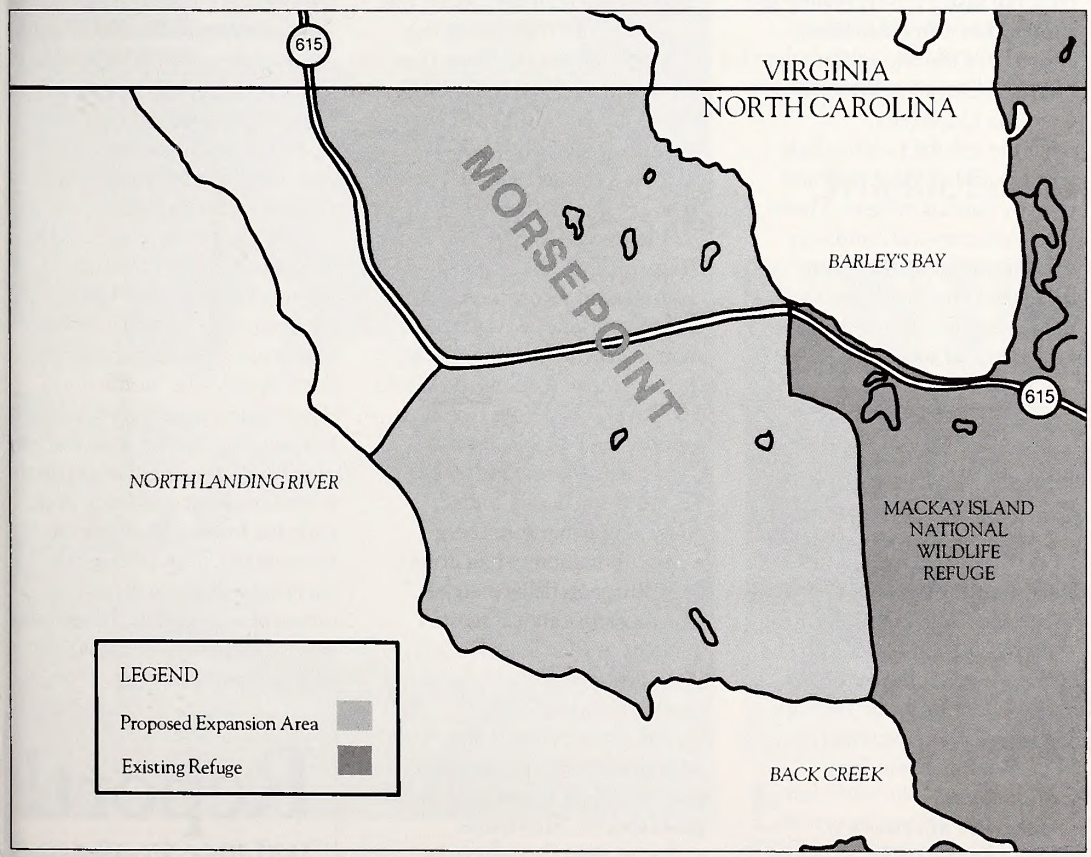
This waterfowl conservation organization, whose founding committee included conservation giants J.N. "Ding" Darling and Aldo Leopold, later became Ducks Unlimited in 1937.

Mackay Island remained in Knapp family hands until 1954, when it was sold by Knapp's widow to a timber company.

In 1961, the island was acquired by the Fish and Wildlife Service for inclusion in its national wildlife refuge system. Today, the 6,997-acre refuge provides excellent habitat for wintering waterfowl populations such as snow geese, pintails, mallards, green-winged teal and tundra swans. Wood ducks and black ducks also breed on and utilize the refuge year-round. The refuge also provides habitat for many other wildlife species by preserving valuable wetlands.

In addition to protecting actual wildlife habitat, the inclusion of the additional acres will help protect the quality of nearby waters from the cumulative impact of increased runoff and pollution from paved surfaces and septic systems inherent with heavy residential development.

Souheaver said she expects the Fish and Wildlife Service to grant final approval for the acquisition sometime this year and hopes the actual acquisition will be completed in two to five years. The proposed expansion would bring the refuge's total acreage up to 8,337.




**Wetlands For Waterfowl:** *By acquiring 1,350 acres of wetlands and wildlife habitat adjacent to the Mackay Island National Wildlife Refuge, the Fish and Wildlife Service hopes to preserve valuable wintering waterfowl habitat from encroaching urban sprawl.*

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before traveling to an event. Listings for this calendar should be conservation-oriented and submitted four months in advance.

**March 6-8**

The Dixie Deer Classic will be held in the Jim Graham Building at the N.C. State Fairgrounds in Raleigh and will feature trophy deer exhibits, deer hunting seminars, equipment exhibits, guides and Boone & Crockett scoring. For more information, contact the sponsors at the Dixie Deer Classic, Wake County Wildlife Club, P.O. Box 12202, Raleigh, N.C. 27605, or call (919) 833-5550.

*At Science Center Through March 22*

## Fly Fishing Exhibit Comes to Hickory

GARVIN HUGHES

***Sporting Exhibit:*** *The Catawba Science Center in Hickory will feature an exhibit through this month called "Anglers All" dedicated to the history of fly fishing. Pictured from left to right are Phil Bracewell and Tom Earnhardt of Trout Unlimited and Thomas Reese, president of The Hickory Printing Group Inc.*

In the 1980s, few outdoor activities attracted more attention or new devotees than the sport of fly fishing, especially fly fishing for trout. While this surge in the popularity of fly fishing is relatively new, the sport itself is old and has a venerated tradition.

In celebration of fly fishing's rich history, the Catawba Science Center in Hickory is sponsoring "Anglers All," a series of exhibits and seminars highlighting the sport and tradition of fly fishing in America. The exhibit opened in January and will run through March 22.

Organized by the American Museum of Fly Fishing in Manchester, Vt., the exhibit includes dozens of rods, reels, flies and memorabilia from fly fishermen from the 18th century to modern times.

The exhibits will feature angling memorabilia from fly fishing notables such as President Herbert Hoover, Ernest Hemingway, Bing Crosby, Zane Grey, Samuel Morse and Andrew Carnegie. There will also be original art and important books, including an early edition of Izaak Walton's *Compleat Angler.*

For history buffs, there's also a pictorial history of fly fishing in the southern Appalachians, courtesy of the Mountain Heritage Center at Western Carolina University.

Other exhibits will include antique and modern rods and reels by famous makers. There will also be several hands-on exhibits designed for young fishermen that will allow them to create giant flies and knots and to feel what it's like to catch a fish.

Each weekend, there are featured seminars and presentations on fishing and conservation topics. In March, scheduled topics include fly tying, a tackle workshop, photography and back-country fly fishing.

Sponsorship and funding for the exhibit was provided by the Northwestern chapter of N.C. Trout Unlimited, the Hickory Printing Group Inc. and the N.C. Wildlife Resources Commission.

For more information, contact the Catawba Science Center, 243 Third Avenue NE, P.O. Box 2431, Hickory, N.C. 28603, or call (704) 322-8169.

*Populations Have Declined*

## Moratorium Declared on Sturgeon Harvest

In a move marking the end of an era, sturgeon fishing in North Carolina was eliminated this September when the N.C. Division of Marine Fisheries declared a moratorium on all sturgeon harvest in the state.

One hundred years ago, rivers all along the Atlantic Coast supported a tremendous sturgeon fishery. In the 1890s, for instance, 7 million pounds of sturgeon were landed along the East Coast. Unfortunately, this intense overfishing, coupled with dam building and pollution, depleted the fisheries by the early 1900s. This primeval species has never really recovered.

No active hook-and-line fishery exists in North Carolina for sturgeon, although small-scale commercial net fishing has persisted until the closure this fall, especially in the Cape Fear River system. In the mid-1980s, annual landings in North Carolina averaged about 11,000 pounds, although they fell to less than 7,000 pounds in 1990.

A research team for the South Atlantic States Marine Fisheries Commission recommended the closure last fall. "We felt that shutting the fishery down was the best move to allow the stocks to recover," said Fritz Rohde, a supervising biologist for the N.C. Division of Marine Fisheries. "The closure doesn't affect many people because there weren't but about a half dozen or so sturgeon fishermen left." The moratorium will remain in effect until at least Dec. 31, 1993, and will probably be renewed, Rohde added.

The moratorium is also intended to protect the shortnose sturgeon, a federally endangered species. Shortnose sturgeon were thought to be extirpated from North Carolina waters since the 1800s until a commercial fisherman pulled one from the Brunswick River in 1987. Currently, researchers with the N.C. Cooperative Fish & Wildlife Unit have been conducting a tagging study on shortnose and Atlantic sturgeon in the Cape Fear in an attempt to understand more about the distribution and abundance of the fish.

Although sturgeon spawn in several North Carolina rivers, the Cape Fear River system is the primary sturgeon watershed in North Carolina. Some sturgeon are caught each year accidently during the early spring shad netting run. "If you catch a sturgeon, you should release it immediately," Rohde said.

A fishery management plan for Atlantic sturgeon was begun in 1988 in an effort to restore the populations. The plan was officially adopted in 1990. Goals are to protect the Atlantic sturgeon from further depletion, improve knowledge of its life history, coordinate research and management and restore the stock of sturgeon.

Biologists believe one of the reasons sturgeon have not rebounded is because female sturgeon take up to seven years to mature and to reach reproductive age. The moratorium should allow more fish to survive to spawning age. Despite the halt of fishing pressure, though, little is known about spawning sites, early life history or migration movements. This prehistoric survivor will also still have to contend with polluted rivers and water-control structures that may hamper spawning.

**Report!**
**Wildlife Violations**
1-800-662-7137

*Angler Targets Little Known Species*

## New Smallmouth Buffalo State Record Caught

It may be news to some anglers in North Carolina, but there actually is a fish called a buffalo.

What's a buffalo? It's a member of the sucker family and looks similar to carp. (Take one look at the fish and you'll know why it's called a buffalo. It's fat and hump-backed.)

The buffalo, however, is nothing new to Tony Crawford of Kings Mountain. Crawford, who avidly fishes for buffalo, pulled the new state record smallmouth buffalo—a 61.02 pound specimen—from the waters of Lake Wylie on December 1. Lake Wylie is considered one of state's best buffalo-producing lakes, and the reservoir has produced several state record buffalo in the past.

Crawford's catch was 44 inches long and had a girth of 36 and ½ inches. The new record broke the old record by about 16 pounds. The old record was 45 pounds, 2 ounces. The buffalo species is most commonly associated with the Mississippi River drainage. The species was apparently introduced to North Carolina, although details of its introduction are obscure. There are three species of buffalo, with two of them—the smallmouth and bigmouth species—found in North Carolina. Until recently, few people fished for buffalo and most fish were taken accidentally.

Crawford's fish, however, was no accident. A self-described "serious buffalo fisherman," Crawford was fishing for buffalo with a bait that he had designed especially for the species. "I was using a packbait," he said. "My brother and I came up with the recipe for it."

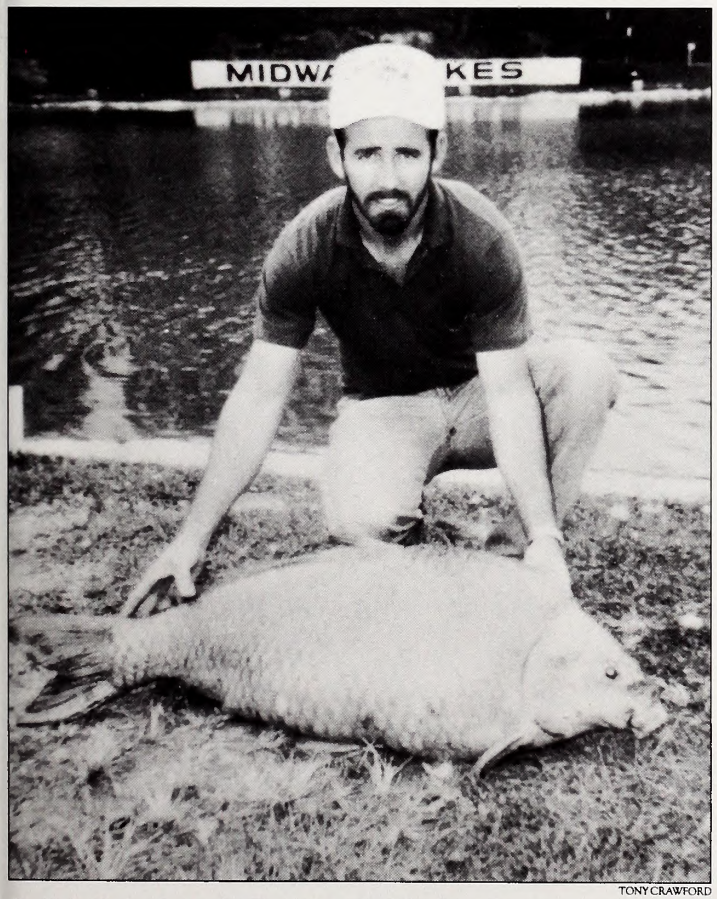
"To make a packbait for buffalo, you thread a Sugar Pop or Corn Puff (cereal) on the hook. Then you pack a mixture of instant and regular grits around it. Then cast it out and let it sink to the bottom. After about two minutes, the grits fall off and the buffalo will begin sucking the grits off the bottom. Eventually, it will suck the Corn Puff up too. Then you've got him."

Crawford landed the record-breaker after a 20-minute battle on a baitcasting rod and reel.

Crawford said he has been fishing for buffalo for about five years. "We spend several thousand dollars on chicken scratch each year to attract buffalo to our fishing holes," he explained.

After catching the buffalo and carp from Lake Wylie, Crawford and his brother often release the fish in two 5-acre pay-to-catch ponds that they manage. "Fishing for these buffalo is getting to be real popular," Crawford said. "Some days we have 60 or 70 people at our lakes fishing for them. Last year, over 600 buffalo weighing over 25 pounds were caught from our ponds." Although the fish is edible, virtually all of the buffalo are released, he added.

"I hate to kill them," he said. "I wish we could have let this one go in our ponds, but since we kept it, we're going to have it mounted."




TONY CRAWFORD

**Buffalo Record:** *Angler Tony Crawford displays the new state record smallmouth buffalo he pulled from the waters of Lake Wylie on December 1. Crawford caught the 61.02 pound fish on a packbait he designed especially for buffalo.*

## Wildlife Endowment Fund Report

**Dec. 31, 1991**

Principal Balance
$16,510,523.29

Interest Earned
$8,676,087.47

Total Receipts
$25,186,610.76

Interest Used
$3,282,016.48

Fund Balance
$21,904,594.28

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

# Burning for Wildlife

*by Vic Venters*

Smokey the Bear didn't tell the whole story. Fire can be good for wildlife—but only under certain circumstances. Read this and check with the experts.

*Burning News:* Without question, prescribed burning (the intentional setting of controlled fires) is one of the best land management techniques available to those who want to improve their land's wildlife habitat. Not only can timber production and game species like quail and turkey benefit, but also non-game species like bluebirds and kingbirds thrive on the increased quantities of seeds and insects available after fire. Also, many rare plants and endangered wildlife species like red-cockaded woodpeckers depend on periodic burning to maintain their ecosystems.

Prescribed burning for wildlife works best in the pine forests—longleaf, loblolly or pond pine—of North Carolina's Coastal Plain and Piedmont. Because of steep terrain and vegetation differences, prescribed burning is sometimes not feasible in the mountains or at some Piedmont locations. However, fire can be used successfully in these areas in certain instances. March through late spring is an excellent time to schedule a prescribed burn. Before you break out the matches, however, you'll need to coordinate forest burning with the N.C. Division of Forest Resources. Check with your county forest ranger for local permits or a Cooperative Extension Agent for more information. Foresters will provide you with technical assistance, plus information on local restrictions and best burning conditions.

The Wildlife Resources Commission's district biologists can provide technical assistance so that you achieve desired wildlife benefits. If you'd like more information, the Wildlife Resources Commission, the N.C. Cooperative Extension Service and the Division of Forest Resources have just published a new pamphlet, *Wildlife and Prescribed Burning: Fire As A Forest Habitat Management Tool.* You can obtain a free copy by writing the Wildlife Commission's Division of Wildlife Management, 512 N. Salisbury St. Raleigh, NC 27604-1188 or by calling (919) 733-7291.

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Make your contribution to the Nongame and Endangered Wildlife Fund directly or through the checkoff on your state income tax form.

## Family Interludes

Birds of a beak sit cheek to cheek on this nest, and that's good news for the future of brown pelicans now that DDT no longer thins the egg shells.

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# WILDLIFE IN NORTH CAROLINA

APRIL 1992 $1.50

# Junior and the Record Bass

*by Jim Dean*

This is the little-known true story of how lying and drinking can lead to fame and fortune. And it's not even an election-year tale.

It all began about 1965 or 1966 when a poor Georgia dirt-farmer with a snootful of steam whiskey showed up at a stock car race carrying the head of what appeared to be a monstrous largemouth bass. He claimed he'd caught the fish, and that it had weighed 25 pounds, a good bit bigger than the well-known world record 22-pound, 4-ounce largemouth that George Perry caught in 1932.

Word began to get around, and it soon reached Jim Morrison who was, at the time, information officer for the Georgia Game & Fish Commission. Morrison got his tape recorder and went looking for a man named Junior Samples. Morrison knew that anyone who might actually catch a new world record largemouth would be famous.

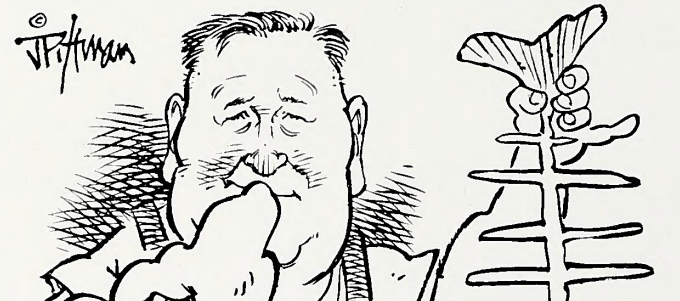

ILLUSTRATION BY JACKIE PITTMAN

Morrison found Junior at his home, and he interviewed him twice. Junior, being drunk as a hoot owl both times, regaled Morrison with a series of stories. Junior claimed he and his family had eaten the fish, and he couldn't seem to recall the country store where he'd weighed the fish even though he let Morrison drive him around one afternoon looking for it. At some point, Morrison either realized the whole thing was a hoax, or Junior 'fessed up. Indeed, the fish head displayed at the race track turned out to be the head of a salt-water fish, probably a sea bass or grouper, that Junior had apparently caught off North Carolina's coast. That's where matters stood until the Southeastern Outdoor Press Association meeting at Santee-Cooper, S.C. that year. Just for the fun of it, Morrison brought along his tapes and played them for his fellow writers.

"They were so funny we were rolling on the floor," recalls Bodie McDowell, who has been outdoor editor of the Greensboro Daily News since 1964. "All of us advised Morrison to get the tapes made into a record."

Clearly, whatever else Junior Samples was, he was a masterful story teller. Morrison made the right contacts, and a 45 rpm record was cut in Nashville. Junior's original interviews were only lightly edited and backed up by some banjo music. One side featured the "World's Biggest Whopper," an obvious double entendre, while the flip side featured several other hilarious stories, including one Junior told about his first ride on a motorcycle.

Because Junior happened to mention that his "whopper" was caught using a Zebco 33 reel, the Zebco Corporation bought 750 of the records and used them as part of a promotional mailing. Most of those records were sent to members of the Outdoor Writers Association of America. It's not known how many more 45 rpm records were made or sold, but Lanni Templeton at Zebco says some of the folks there recall that Junior may have also recorded one or two albums of his tales.

At any rate, Junior was invited to appear on the popular television show, "Hee Haw" and remained to become a regular fixture for years. Viewers will remember him as the bumbling used car salesman in overhauls who bantered with the fetching Misty Rowe and encouraged potential buyers to pick up the phone and call BR 549, whatever that was. During his spare time, Junior continued to fish, and he bought a fancy bass boat so he could compete in some of the tournaments.

Recently, while rummaging through some old stuff at home I ran across the 45 rpm record that Zebco had sent to outdoor writers back in the mid-1960s. I played it again just for laughs. It's still just as primitive and hilarious as ever, funnier still when you know that it's the original tape of Morrison's misadventure in rural Georgia all those years ago.

The story of Junior Samples seems to have come full circle of late. Those who would admit to being long-time fans of "Hee Haw"—okay, I confess—are dismayed by the recent efforts to remove the country look and homogenize the show into some sort of upscale hybrid. Gone are the Cornfield County antics, the familiar songs and skits and a lot of the regulars including Ronie Stoneman, Nurse Goodbody and even Misty.

Even had he not died a few years ago, Junior would never have fit into the new format. Shucks, he barely fit the old one. Some say he could be ornery and that his continuing fondness for spirits was not exactly an asset. Still, it's a pretty good bet that what the television audiences saw in Junior was a genuine artifact of at least one segment of the rural, red-mud South.

I never met him, but I once saw him while I was at a conference in Nashville. He was in the lobby of the hotel, in overhauls as usual, standing in line to get Dennis Weaver's autograph. Somehow that seems to fit.

April, 1992
Volume 56, Number 4

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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*by Christopher Camuto* © 1992
*Our trout streams are on the brink of disaster unless something is done soon, and the culprit is not bad water, but bad air.*

18 **Turkey Tag** *by Joel Vance* © 1992
*Think of turkey hunting as a gigantic board game, one in which the human player is very likely to be gobbled alive.*

22 **Ghosts of the Pinelands** *written by Garnet Bass* © 1992
*photographed by Derrick Hamrick* © 1992
*Well-adapted to the longleaf pine forests of the Coastal Plain, the endangered red-cockaded woodpecker hangs on, with a little help from its friends.*

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**Nature's Ways** *by Lawrence S. Earley*

**Back of the Book** *by Vic Venters*

**Wildlife Through the Year** *by Vic Venters*

**Cover** *Mist shrouds an old-growth forest deep in the Southern Appalachians. Photograph by William S. Lea.*

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***Soaking wet after*** *they emerge from their underwater hunts, anhingas (left) and cormorants (above) spread their wings to dry their feathers. Yet anhingas also expose their wings to the sun when they are dry, suggesting that anhingas, unlike cormorants, exhibit this posture mainly to regulate their body temperatures.*

***Though anhingas' feathers*** *are not waterproof, this is actually an advantage for the bird's hunting style. Waterproof feathers would be buoyant, forcing the anhinga to the surface. But wet feathers enable the bird to stay underwater for minutes at a time, enabling it to swim powerfully after its fish prey.*

# Soggy Feathers

*written by Lawrence S. Earley/illustrated by David Williams*

Very often we notice similar behavior in different animal species and we're tempted to think that the reasons for it are the same. That's not always true.

For example, anhingas and cormorants spend much of their time perched in trees above freshwater ponds with their wings spread. This posture has also been noted in other aquatic birds such as brown pelicans and great blue herons, and even turkey vultures do it, but it has been studied best in anhingas and cormorants. Both birds make their livings by fishing underwater. Do they spread their wings to dry their feathers?

It would seem logical, yet it's more complicated than that. For one thing, why would an aquatic bird have to dry its feathers anyway? Most aquatic birds have feathers that repel water. As soon as a duck pops to the surface, for example, water beads up and rolls off its back. That's because ducks and other aquatic birds, preening their feathers many times a day, coat them with an oily substance produced from a special gland called the uropygial gland. The oil not only waterproofs the feathers but actually keeps feathers, beaks and even feet in good condition.

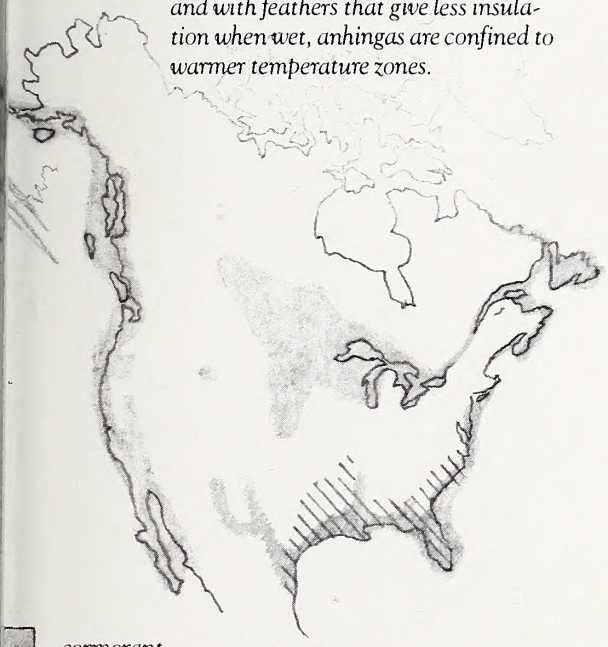
But because nature gave anhingas and cormorants a runt of an oil gland, their feathers absorb water rather than repel it. For a duck, this feature would be disastrous, but for cormorants and especially anhingas it's doubtful that either could successfully exploit its habitat without it. Both birds hunt by diving beneath the surface, sighting their prey and then swimming after it. Studies of anhingas show that wettable feathers enable them to remain motionless underwater for minutes at a time. With water-repellent feathers, the birds would expend so much energy overcoming the buoyancy of their feathers that they'd be less effective hunters.

But surely that means that once the two birds emerge they have to dry their feathers, somewhat like hanging wet clothes out to dry. Similar behavior, similar purpose. Well, yes . . . and no.

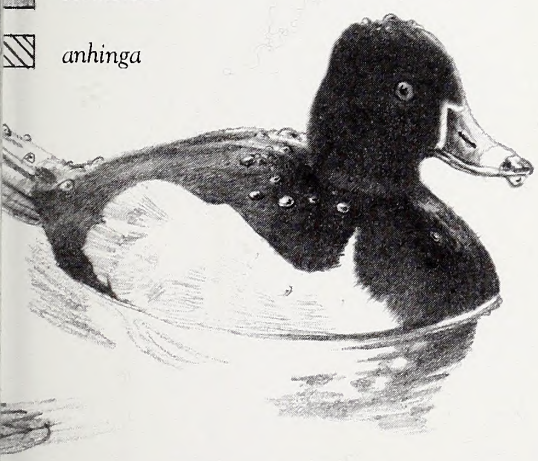
Biologists studying anhingas have noted that the birds spread their wings more commonly in cool weather than in hot weather, when the birds were dry more often than when they were wet. And when they spread their wings, they turned their backs perpendicular to the sun, as if exposing the maximum surface area to the sun's rays. Anhingas are such efficient predators that they spend less than an hour a day hunting, and only for a few minutes at a time. The birds spend even less time in the water when it's cool and extend their wings before they enter the water as well as after coming out.

Cormorants, on the other hand, exhibit spread-wing postures only when wet, on cloudy days as well as on sunny days. Their feathers, moreover, differ from anhingas' feathers in an important way: they are unwettable closer to the body, wettable farther away. This means that unlike anhingas' feathers which allow water to reach the skin, cormorants have an insulative layer of air next to the skin. And cormorants produce more body heat than anhingas because they have a higher metabolism.

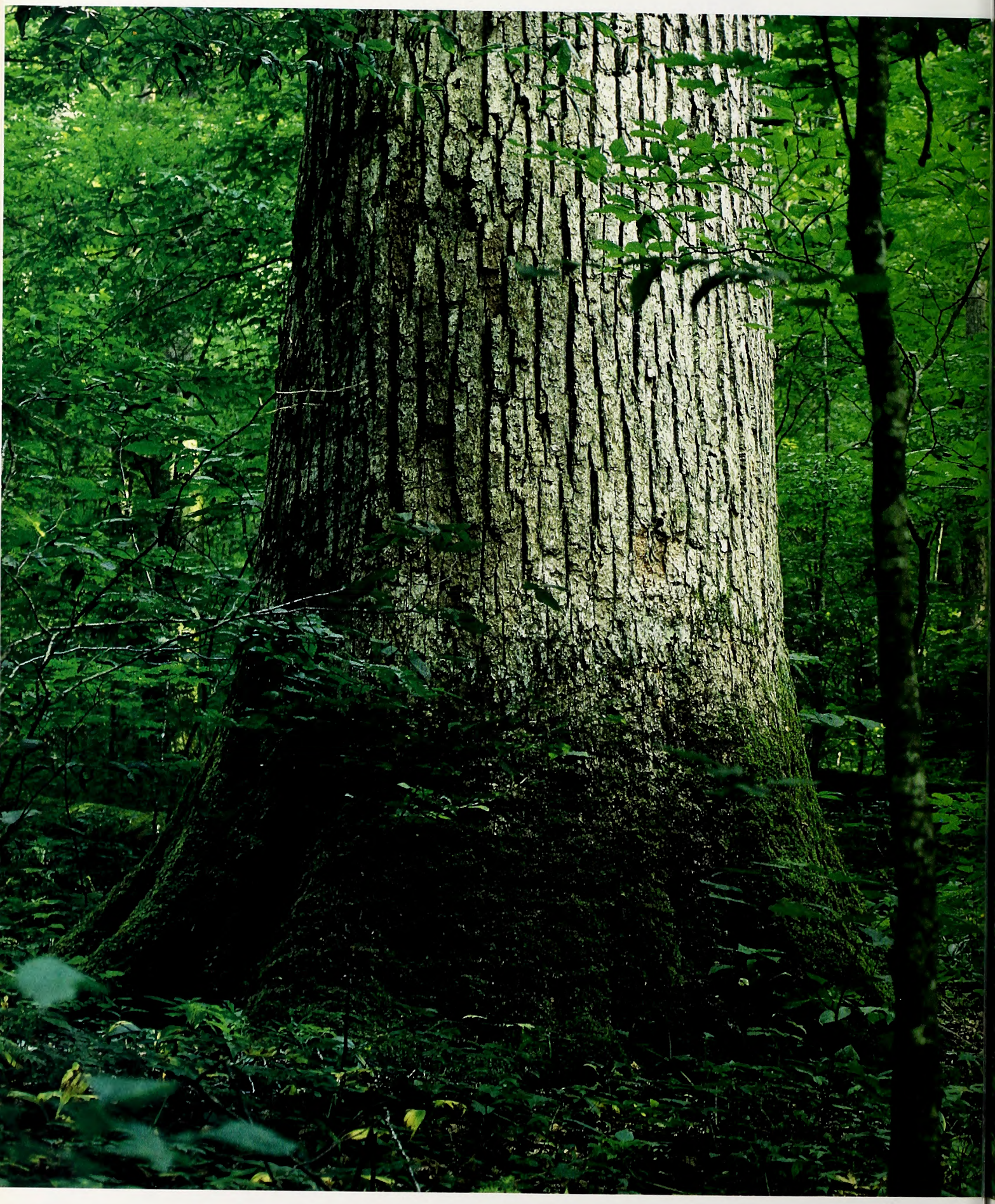
What all this adds up to, then, is that cormorants spread their wings primarily to dry them out. But an anhinga spreads its wings in the sun not only to dry out but for the same reason that we cozy up to a wood stove after a cold day afield—to raise its body heat. By exposing its black, heat-absorbing plumage to the sun, an anhinga is seeking to reduce heat loss aggravated by its wet plumage.

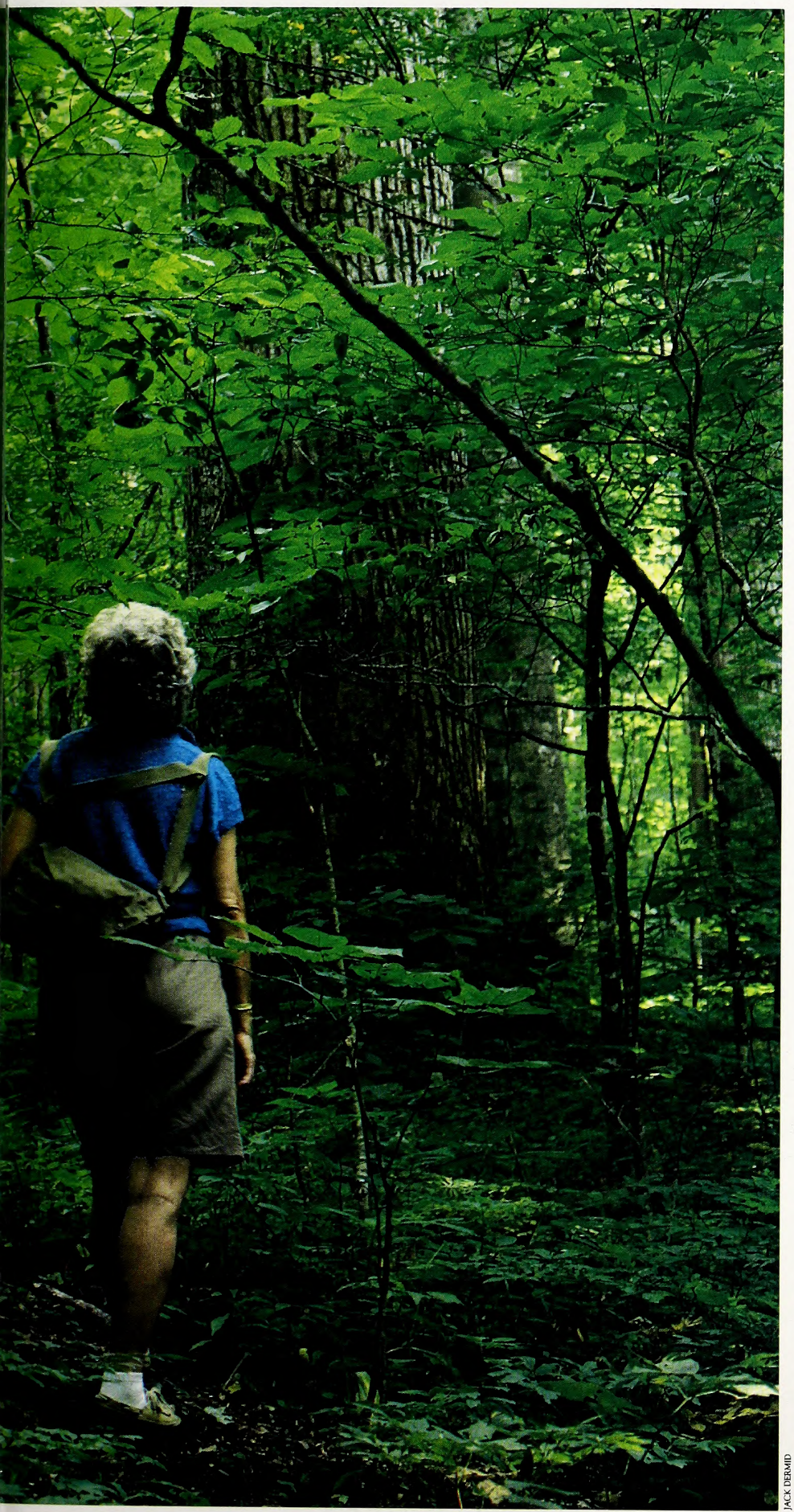



***Because cormorants** get better insulation from their feathers than anhingas, they can range much farther north. With their slower metabolism and with feathers that give less insulation when wet, anhingas are confined to warmer temperature zones.*



***When a ring-necked duck** surfaces after foraging underwater, water beads up on its feathers. Its waterproof feathers maintain an insulating layer of air next to the skin.*





JACK DERMID

# Where The Old Trees Grow

"Whatever the nature of the power possessed by trees, old-growth forest distills and concentrates the elixir."

—*Robert Leverett*

by Lawrence S. Earley

Within a day's drive of most North Carolinians lie some of the most storied old-growth forests in the nation.

This may be hard to believe, especially if your mind is filled with images of the ancient conifer forests of the Pacific Northwest. Embroiled as they are in a bitter battle between loggers and environmentalists over the endangered northern spotted owl, these forests are practically synonymous with old growth. Yet the Northwest doesn't have a monopoly on old-growth woodlands.

In the Smokies, for example, you can hike through the virginal recesses of wet cove forests, high-elevation spruce-fir forests and northern hardwood forests. In a remote corner of the Nantahala National Forest lies Joyce Kilmer Memorial Forest, a virgin remnant of the great hardwood forests that clothed the Appalachians when Christopher Columbus first set foot on our shores. And on the Black River, in the eastern part of the state, canoers may view a bald cypress stand containing the oldest trees east of the Rocky Mountains.

Amid the mostly managed landscapes around us, such forests offer startling diversity for wildlife and humans alike. They also pose

***Enormous yellow poplar trees** dwarf a visitor in the Joyce Kilmer Memorial Forest in Graham County. The forest contains a small remnant of the virgin forests that once cloaked the Appalachian highlands.*

JACK DERMID

***Yonahlossee salamander** finds a niche in a rotting log on the forest floor. It is among many species that find homes and food as a tree decomposes.*

JACK DERMID

***Terrestrial snail** finds a habitat among the mosses that colonize logs in Joyce Kilmer Memorial Forest. Snails may be eaten by salamanders.*

JACK DERMID

***Shelf fungus** sprouts on a rotting log. The dead tree's nutrients are recycled as these growths nourish a large number of slugs, ants, turtles and snails.*

tough challenges to public and private landowners who are managing the fragments of old forests that are left.

***Indeed, given the*** voracious logging that consumed the Eastern forests by the 1920s, it's hard to imagine that anything escaped. Virgin forests? Tell me another one. And human effects on forests don't stop with logging. Many forests have been altered by a Pandora's box of human-caused ills that include air pollution, acid precipitation and exotic pathogens like the fungus that eliminated the native chestnut tree, once the dominant tree in our hardwood forests. We've excluded fire from forests that need it to survive. We've tinkered with the wildlife in our forests, removing some species, such as wolves and panthers, and introducing others, such as wild boars.

All of these have subtly and not-so-subtly changed the composition of our forests. And this tally only accounts for human effects *since* European settlement.

"If you wanted to be strictly pure about it you'd have to consider man's influence before white men arrived, which goes back 11,000 years or so in North Carolina," says Merrill Lynch, a biologist with the N.C. Nature Conservancy. "The Indians certainly would have had an effect on certain forests, particularly with their use of fire. In that case, there would be no true virgin forest, particularly in areas that Indians may have burned."

Still, some stoutly defend "virgin forest" as a useful concept. "Logging in particular has had such a pervasive influence," says Mike Schafale, a survey specialist with the state's Natural Heritage Program, "that it's useful to have a word that describes places that have not been logged, which is what people think of when they think of virgin forests. And though these forests have been affected by wide-ranging air pollution and introduced pathogens, they are still more natural than areas repeatedly logged or cleared or settled."

Schafale as well as most ecologists are more comfortable with the term "old-growth" forest, even though the two terms don't refer to the same thing. Old growth is a more inclusive term than virgin forest. Once logged, a virgin forest will never be virginal again. But it may achieve old-growth conditions in time—although how much time depends on the species. It may take a Douglas fir forest 400 to 500 years to grow from seedling stage to old-growth condition; an Appalachian cove forest 300 years; a black willow stand, less than 100 years.

The most famous old-growth (and virgin forest) in the East is nestled in Graham County, in the southwest corner of North Carolina, where the 3,800-acre Joyce Kilmer Memorial Forest has been set aside as a haunting reminder of our once-great Eastern hardwood forests. More than 100 species of trees are found in Joyce Kilmer, some of them 20 feet around at the base and more than 100 feet tall. Along Little Santeetlah Creek you'll find virgin hemlocks and white pine; on the well-traveled, 2½-mile loop trail, a rich cove forest shades you under a cooling canopy of tulip poplars, oaks, basswoods and beeches. So unbroken is the shade that midday light reaches the forest floor only in shafts of golden light.

Most visitors are awed by the big trees, but that's not the only sign of old growth. Strange as it may seem, the younger, smaller trees in between the giants are better signs that the forest has attained old-growth status. And for a sure sign, look at the forest floor. Moss-covered logs lie atop one another like pick-up sticks. Other veterans, barkless and rotting, are still standing decades after their demise.

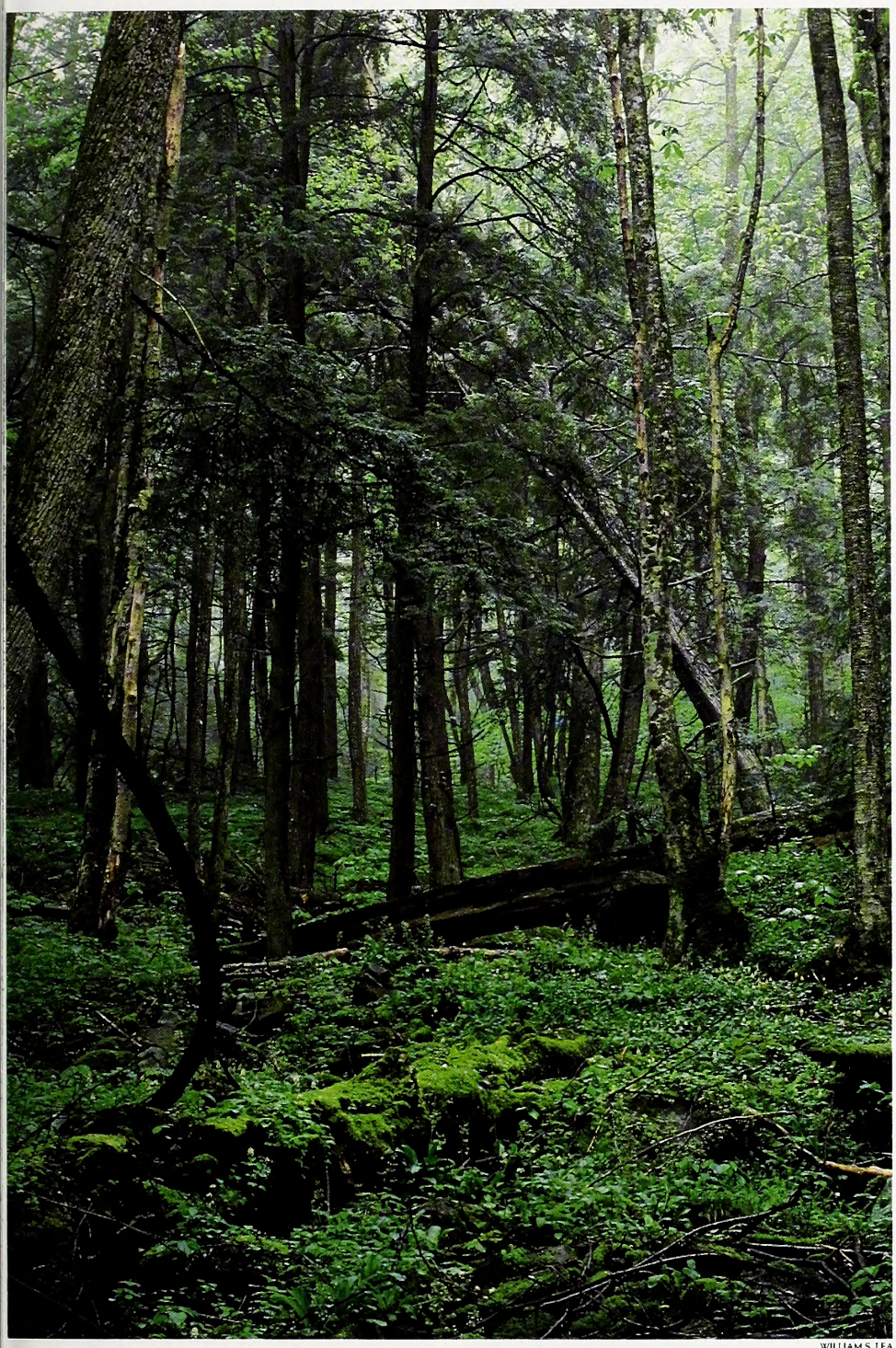
"Old growth is not just a younger forest grown up to a larger size," says forester Jerry Franklin, who has worked on the ecology of old-growth forests in the Pacific Northwest. What he means is that a young forest may mature and the trees achieve great size, but old-growth conditions don't occur until substantial numbers of the trees begin to die. When they topple over, they drag down other trees with them, creating gaps in the solid canopy overhead. Into the sun-flooded spaces rise scores of shade-intolerant tree seedlings, wildflowers, shrubs and ferns. They had been idling their motors for decades waiting for this sunny opportunity.

"That might be the most dramatic thing about old-growth forests," says Schafale. "An old-growth forest will actually have fewer large, old trees than an even-aged forest at an advanced age. That's because there are so many gaps where young trees come in."

Of course many trees—most of them—don't die of old age. They may be struck by lightning, burned by fire, overtaken by disease, toppled by hurricanes, tornadoes or heavy winds. However it happens—by old age or by natural disturbance—these deaths create gaps or patches in the canopy that new trees take advantage of. Thus the forest perpetuates itself, achieving an equilibrium in which the deaths of some trees are equaled by the growth of others.

This diversity of tree ages and sizes creates a forest with multiple canopy layers. It is a richer, more complex forest than the uneven-aged forest that preceded it.

As ecologist Robert Leverett writes: "Mother Nature uses time and the elements to sculpt the forest; she makes a place for trees of many species and ages. It is an ecosystem in balance. It feels right. It looks right. It is right!"



WILLIAM S. LEA

***Old-growth forests*** *contain numerous dead trees that rot on the forest floor. Dead trees help the forest in many ways: by recycling nutrients for new growth, by preventing erosion and by providing habitats for scores of plants and animals.*

***Of course that*** depends on who's looking at it. A forest full of dead and dying trees is not a pretty sight to a traditional forester. Trees that reach this stage are "decadent," "overmature" or "senescent," according to some foresters, and their wood has been wasted. Once trees age beyond their maximum growth potential and are no longer putting on wood, they should be harvested. From this pont of view, the value of old growth is calculated in economic terms: rotting wood is wasted timber and wasted money.

But in the past few decades, ecologists studying the forests of the Pacific Northwest have learned that these multi-layered, uneven-aged forests, with tons of dead wood standing or rotting on the forest floor, perform valuable services.

## Where To See Old Growth

Inaccessibility is the secret behind the survival of some old-growth and even virgin forests in the mountains. That's good for the forest, but not so good for those who'd like to experience old growth. Luckily, short hikes can put you in several virgin forests in the Smokies, and some old-growth stands in national forests, including Joyce Kilmer Memorial Forest, are also within reach.

### *Great Smoky Mountains National Park*

**Thomas Divide Trail** (virgin northern hardwood forest). Trail starts about three miles south of Newfound Gap on the Newfound Gap Road.

**Fork Ridge Trail** (virgin northern hardwood forest). Trail starts about 4½ miles from Newfound Gap on the Clingmans Dome Road.

**Cove Mountain Trail** (virgin cove hardwood forest). Trail begins at Laurel Falls parking area on the Little River Road. Go past the falls (4 to 5 miles roundtrip).

**Boogerman Loop Trail** (virgin cove hardwood forest). Trail begins at the Caldwell Fork Trail near Cataloochee Campground (6½ miles roundtrip).

**Snake Den Ridge Trail** (virgin cove hardwood forest). Trail starts in B-Loop of Cosby Campground. Virgin forest begins about 1 mile from the trailhead.

**Appalachian Trail** (virgin spruce-fir forest). Start anywhere between Newfound Gap and Clingmans Dome.

*(For more information about hiking virgin forests in the Smokies, write GSMNP, Gatlinburg, Tenn. 37738.)*

### *Blue Ridge Parkway*

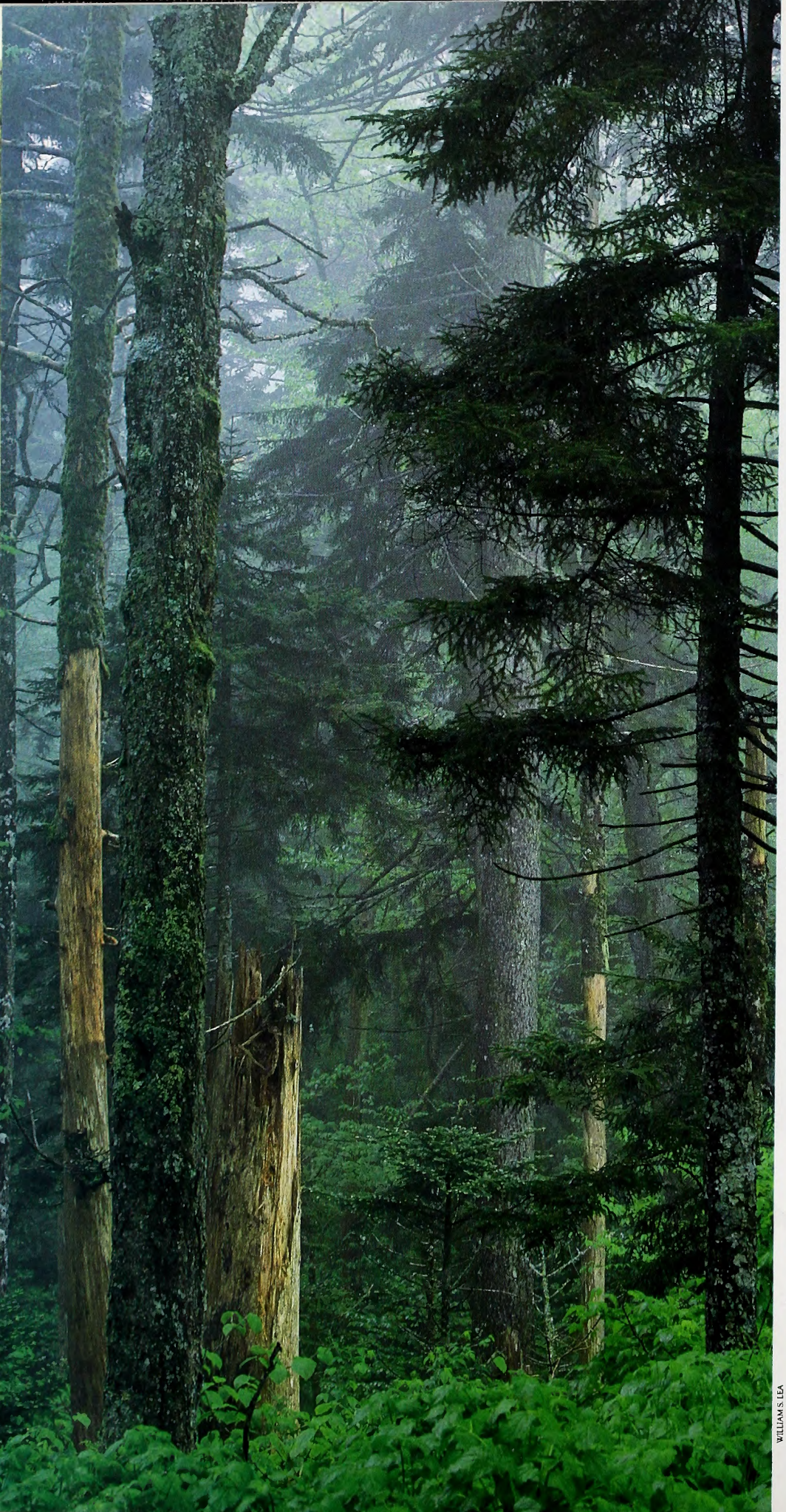
**Moses Cone Memorial Park** (virgin hemlock). Milepost 294 on Parkway, near Blowing Rock.

### *Nantahala National Forest*

**Joyce Kilmer Memorial Forest** (virgin cove hardwood forest). Short (2½-mile) loop trail begins 14 miles from Robbinsville on N.C. 129 North.

### *Pisgah National Forest*

**Craggie Wilderness Study Area** (virgin hemlock). Take the Dillingham Road from Barnardsville to Forest Road 74. Road dead ends at trailhead.



WILLIAM S. LEA

***A standing dead tree,*** *also called a snag, is a recognizeable characteristic of this old-growth spruce-fir forest. As dead trees topple, they create openings for new growth. Thus old-growth forests consist of trees of many different ages and heights.*

For example, the millions of leaves hoisted by living trees act as a giant umbrella protecting the soil from the erosive scourings of rainstorms. They also keep streams cool. Decomposing logs help prevent soil erosion and free nutrients for uptake by other plants. Dead trees can also act as nurse logs, providing a physical support for plants and even young trees.

All of these services occur in any old-growth forest, whether it's a hardwood stand along the Roanoke, or a cove forest in the Smokies. Younger forest stages may also share some of these functions, but not to the same degree.

Some foresters used to consider old-growth forests as biological deserts, pointing to the fact that game species such as deer, grouse, quail and rabbits, adapted to younger forest stages, are not found in as great numbers in old-growth stands. "Some species don't do as well in old-growth conditions," says wildlife biologist Dick Lancia of N.C. State University. "Like anything else, various species have different habitat requirements. Species that require early successional habitats won't be present in old-growth forests." And younger forests won't have a great deal of use by turkeys, bears and woodpeckers. Older forests are also full of a diversity of life not found in young forests, and one of the keys to this diversity—wouldn't you know?—is the dead trees.

Before a log completely rots on the forest floor, it will have fed and housed an astonishing number of plants and creatures, starting with fungi and bacteria that begin the decomposition process, and working up the food chain to beetles, spiders, mites, termites, centipedes, voles, salamanders, shrews, squirrels, chipmunks, hawks and owls. Cavities in snags offer nesting and denning habitat for innumerable forest creatures, from raccoons to barred owls to bears.

"If all the trees in a forest were healthy, there'd only be a limited number of niches for animals," says Alvin Braswell, curator of invertebrates at the N.C. Museum of Natural Sciences. "But as trees die, they become available as homes for cavity nesters and species associated with logs."

Because of their heavy leaf canopy and the large number of downed logs, old-growth forests also tend to offer wetter microclimates for a host of small creatures. "Leaves and dead

wood hold moisture and maintain a wetter environment that some species need," says Braswell. The Yonahlossee salamander and Weller's salamander are species that are tied to the wet cove forests of the mountains. The wetter conditions allow them to colonize rock outcrops some distance away from streams. If those trees were cut and the rocks dried out, the salamanders wouldn't make it.

Dead trees also enrich stream life as well. Whole trees or limbs that fall into streams trap small organic material such as leaves and twigs and form the basis for a complex food chain. Fungi and other decomposers colonize the leaves, providing enriched food for zooplankton and macroinvertebrates such as the larval forms of mayflies, caddisflies and stoneflies, which, in turn, are eaten by the top carnivore—trout.

According to Jim Borawa, the Wildlife Commission's trout specialist, "If you compare some of the forests that have been logged to an old-growth forest like Joyce Kilmer, you'll find that where logging has occurred within the last century the streams are relatively low in the amount of large woody debris. From a fisheries perspective, these logs enhance the food source; but from a habitat perspective they diversify the habitat so that it holds fish that we wouldn't ordinarily see."

Borawa is so impressed by preliminary U.S. Forest Service research that he is reconsidering the way streams ought to be managed. "We're looking at imitating what Mother Nature does with regard to large woody debris," he says. "Those kinds of natural debris are more complex than the dams we have been putting in. We think they will provide more habitat for trout, and they will more reflect Mother Nature. It's more natural."

Wildlife Commission nongame biologist Allen Boynton mentions three other reasons why the Commission is interested in maintaining old-growth forests. "One primary reason is the black bear, both to provide it with den trees and food. These logs on the floor are a food resource for the bear," says Boynton. "And then old growth stands can produce a lot of mast for other species. Also, if these old-growth stands are well distributed, they can serve as reservoirs for salamanders and invertebrate species that can colonize adjacent areas even after they're disturbed."

Biologists have been unable to find Eastern plant or wildlife species that are totally dependent on old-growth stages of forests, certainly not like the northern spotted owl that has been tied to Douglas-fir forests. The red-cockaded woodpecker is associated with old longleaf pines (See "Ghosts of the Pinelands," p. 22), but it can also live in second-growth stands if older trees have been left for it. Pileated woodpeckers prefer mature for-

WILLIAM S. LEA

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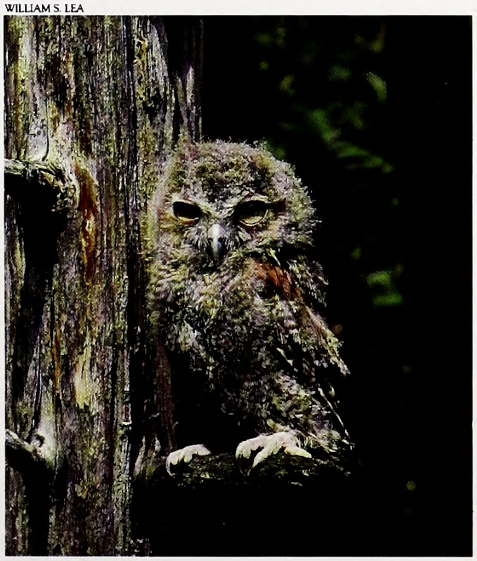
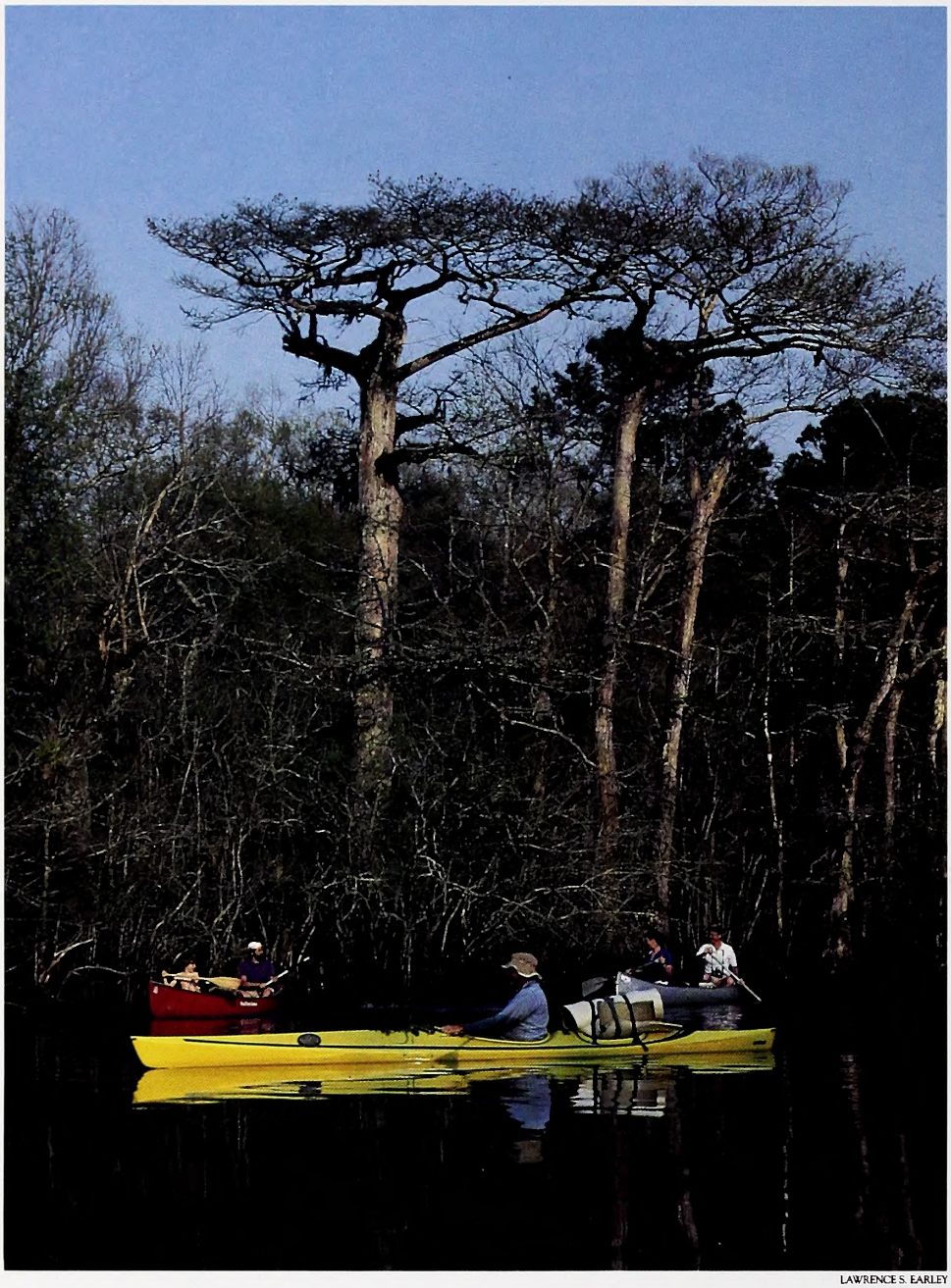


***Snags typically contain cavities*** *as branches fall off and the tree rots. Such cavities provide habitats for numerous birds and mammals, including the screech owl (below) and the black bear. In some areas, bears use openings in dead trees for their winter dens.*



LAWRENCE S. EARLEY

***Flat tops of old-growth*** *bald cypress trees on the Black River are a sign of the trees' advanced age. Many of these cypress trees are more than 1,000 years old, and a few are almost 1,700 years old, the oldest stand of trees east of the Rocky Mountains.*

ests, but not necessarily old growth. Many bird species such as the cerulean warbler, the Mississippi kite, the barred owl and the pileated woodpecker are found at their highest densities in mature or old-growth forests.

Boynton grimly suggests one reason why it has been so difficult to find a dependent species. "The species that were absolutely dependent on old-growth—if there were any—may be gone." The ivory-billed woodpecker, for example, was dependent on the insects that fed on the bark of bald cypress trees in the deep, dark recesses of Southern bottomlands. When most of the cypress was cut in the 19th century, the ivory-bill became extinct.

Yet trying to tally a list of dependent species is not the best justification for preserving old growth, according to Dick Lancia. To him it's a question of maintaining a diversity of ecosystems. "We trivialize this issue by trying to find a species or two here or there for people to rally around," he says. "The issue is, we don't have very much left of communities that are old. And there is an inherent value to protecting some of these old forests. We ought to be arguing for endangered ecosystems as well as endangered species."

***Old growth's biological*** diversity is also the message that Dean Simon brings to private landowners in mountain counties. One of four Wildlife Commission foresters, Simon frequently talks to landowners as part of the state's forest stewardship program, a multi-agency effort to assist private landowners in improving their forest resources (See "New Forest Stewards," Oct. 1991). Occasionally, a landowner has a stand that has historically been excluded from timber cutting because of its inaccessibility. Simon is quick to suggest that the landowner leave it as old growth.

"I explain to them that diversity is the key to wildlife management," he says. "I tell them that they have an opportunity to let it develop into old growth, and that if they do they'll have habitat conditions that favor different wildlife species."

Opportunities like this are rare, admits Simon. So little old growth exists on private lands that landowners are understandably reluctant to set it aside for decades. Fortunately, most old growth in the state lies on public lands where citizens have a voice in deciding how to manage it. The Great Smoky Mountains National Park contains over 100,000 acres of virgin forests, while preliminary figures suggest that another 100,000 old-growth acres may exist in the Nantahala and Pisgah national forests. In the park, these old forests will stay virgin, but in the national forests the Forest Service's management of old growth has been controversial. When the Service issued its Nantahala and Pisgah Na-

***This small virgin longleaf** pine forest in Georgia contains snags, dead trees on the ground, flat tops and many other characteristics of old-growth forests. Whether in a cove forest or spruce fir forest in the mountains, or a gum-cypress or longleaf pine forest in the Coastal Plain, old-growth features are similar.*

tional Forest land and resource management plan in 1987, there were numerous points of appeal. Some of them were upheld, requiring the agency to make an amendment to the forest plan, which it is completing at present.

"The primary issue in the amendment has to do with uneven-aged management of the timber resource," says Ruth Berner, a forest planner with the Forest Service. "One of the points of appeal was that we did not provide information about the amount and distribution of old growth and changes over time." Indeed, the only information in its data bases to aid in calculating its old growth is the number of trees older than 100 years, which is not an infallible sign of old growth. The Forest Service is having to play catch up by a whole new set of guidelines. As it tallies its old growth on Nantahala and Pisgah national forests, it is using more ecological measures, including the number of downed logs at all stages of decay, the number of old trees and standing snags, and the presence of undisturbed soils and uneven structure of canopy trees.

Wildlife Commission biologists and foresters who have worked with the Forest Service are enthusiastic about the new effort. "In the past, the Forest Service defined old-growth stands more in terms of economic maturity than biological maturity," says Dean Simon. "They're changing their definition to better manage for old-growth conditions."

The best chance for old-growth forests in the Southeast may lie in how well the Forest Service does its work in North Carolina. This doesn't mean that there's no room for young, managed forests, nor does it mean that all forests ought to achieve old-growth conditions. But because they are rare and offer vast insights into the biological workings of a natural forest, old-growth forests deserve a reverent niche in our mostly managed landscape.

Says Lancia, "The public ought to be concerned about perpetuating the diversity of natural systems. Old growth is just one of them, although it happens to be one that is almost impossible to create. So the amount of time that it takes to achieve old-growth conditions makes those things very valuable. For that reason alone we ought to be concerned, because we can't recreate these things overnight, if at all." ☒

LAWRENCE S. EARLEY

# Troubled Air, Troubled Water

Our trout streams are on the brink of disaster unless something is done soon, and the culprit is not bad water, but bad air.

by Christopher Camuto © 1992

As you crest the mountains at Newfound Gap, driving east from Tennessee across Great Smoky Mountains National Park, two conflicting images greet you—a magnificent view of the North Carolina Smokies and a battery of signs about air pollution. The scene is resplendent with the promise of densely forested mountains and clear-flowing rivers, as well as the diversity of flora and fauna that has always been a hallmark of the Southeastern highlands. But the signs perched between you and that appealing landscape may well make you wonder about the future of those mountains and the life they support.

Acid rain is prominent among the air pollution problems that worry the National Park Service. Although issues like global warming, ozone depletion and wetlands destruction have been grabbing most of the environmental headlines recently, acid rain remains an insidious threat to plant and animal life. In North America, acid rain primarily has been associated in the past with eastern Canada, New England, and New York's Adirondack Mountains region. But more than a decade's worth of published scientific research has established that the southern Appalachians have been affected by—and remain seriously threatened by—acid rain.

North Carolina's headwater trout streams, which harbor populations of native brook trout as well as naturalized rainbow and brown trout, are one of the important wildlife resources at risk.

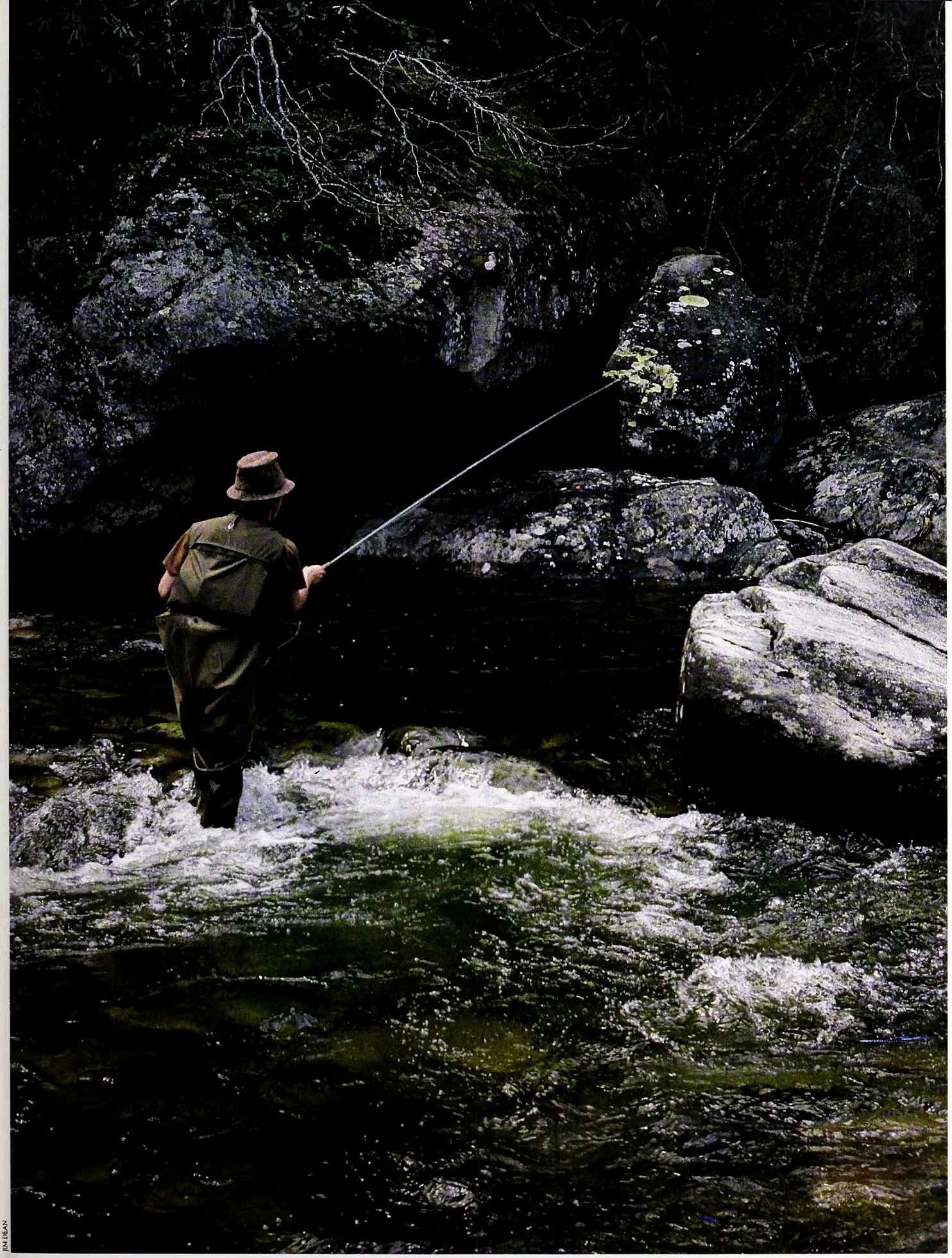
Acid rain is a layman's term. Scientists prefer using another term, acid deposition, because as much as half of the sulfur dioxide and nitrous oxides deposited on a given watershed fall to earth in dry form. The source of those acidifying agents is fossil fuel combustion—smokestack and tailpipe pollution. Although the mountains of North Carolina seem far-removed from the pollution we associate with cities, they are, in the words of one researcher, "in the eye of the storm." The National Park Service signs at Newfound Gap dramatize this. They show two pincers of polluted air masses attacking the Smokies like invading armies, one from the Ohio Valley to the north and the other from industrial sources to the west and southwest.

Sulfur deposition loads in the southern Appalachians are high. About 25 kilograms per hectare of acidic sulfates fall on North Carolina's mountain watersheds every year. Shenandoah National Park in Virginia, and Great Smoky Mountains National Park, which straddles the Tennessee-North Carolina border, receive the highest level of sulfur deposition of any two national parks in the country. Coal-burning power plants, both within North Carolina's borders and beyond, are the principle source of the sulfate that does so much biological damage to aquatic ecosystems.

The southern Appalachians do have one advantage, however. Unlike the northern Appalachians, the southern mountains were never scoured down to bedrock by glacial advances. Therefore, the soil cover in the southern Appalachians is generally deeper and older, and this has temporarily protected the streams that drain these watersheds from the biological effects of acid deposition. The older soils have been absorbing the sulfur that has rained on them in recent decades. But the reprieve afforded by this soil buffer has, in many watersheds, been nearly used up. Many headwater streams are perched on the edge of disaster.

The sensitivity of a stream to acidification, which scientists measure as its *alkalinity* or *acid neutralizing capacity*, depends in part on the kind of bedrock that forms its streambed. Granitic and basaltic watersheds are well-buffered; that is, those streams are well supplied with minerals that can neutralize

***While all looks perfect** in this stretch of beautiful mountain trout water (right), acid deposition is already affecting the water quality of some southern Appalachian streams. With the buffering capacity of soils becoming exhausted, the problem could become critical in the near future. The primary source for acid deposition is fossil fuel combustion in automobiles and coal-burning power plants.*



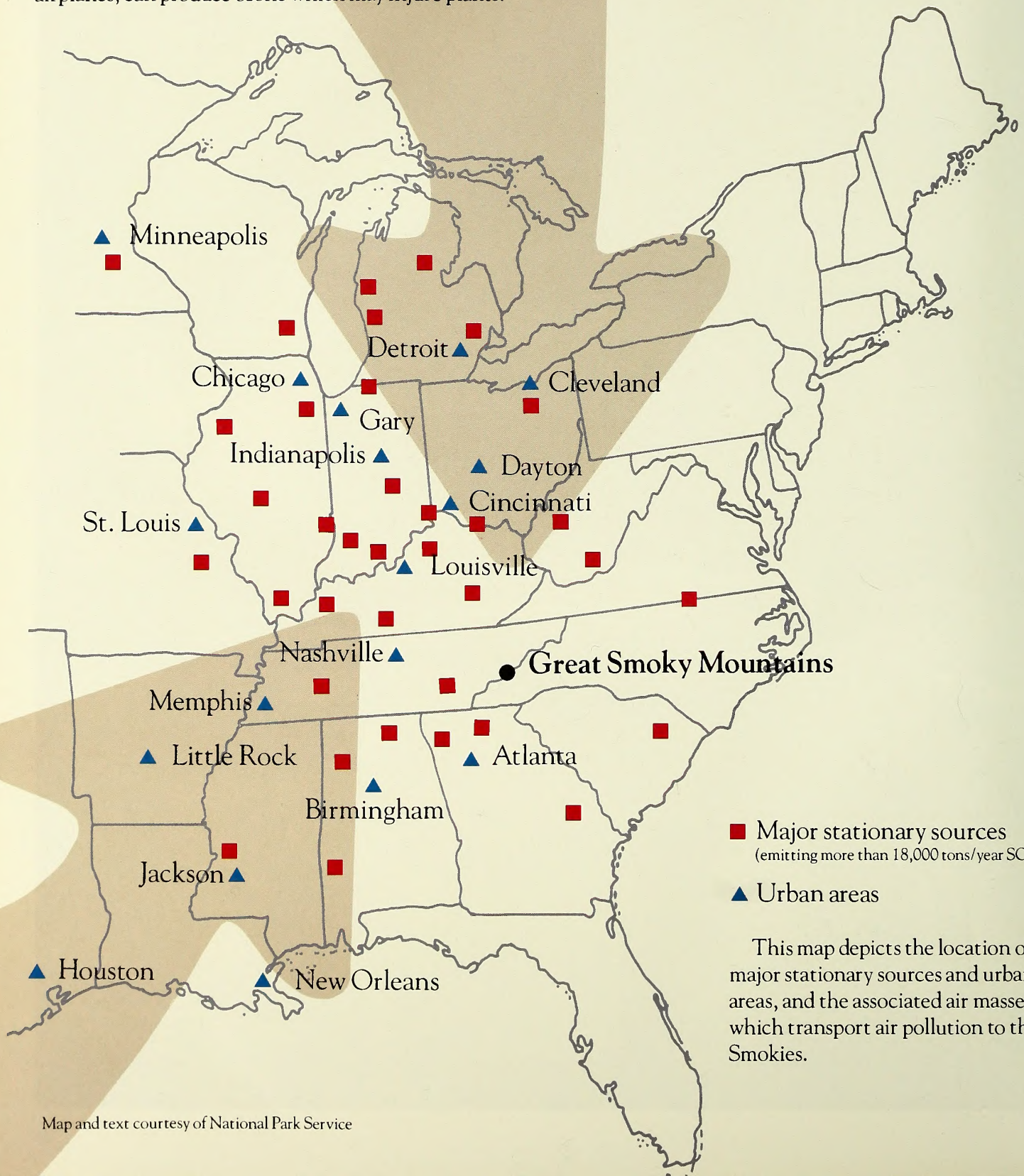
JIM DEAN

# Sources of Air Pollution

There are a variety of air pollutants affecting the natural resources in the Great Smoky Mountains.

Some pollutants come from major stationary sources such as oil and coal fired power plants, industrial boilers and petroleum refineries. By-products from these pollutants form sulfates and nitrates which can result in acid rain and reduced visibility.

Other pollutants come from urban areas. Pollutants from automobiles, trucks, buses, and airplanes, can produce ozone which may injure plants.




This map depicts the location of major stationary sources and urban areas, and the associated air masses which transport air pollution to the Smokies.

Map and text courtesy of National Park Service

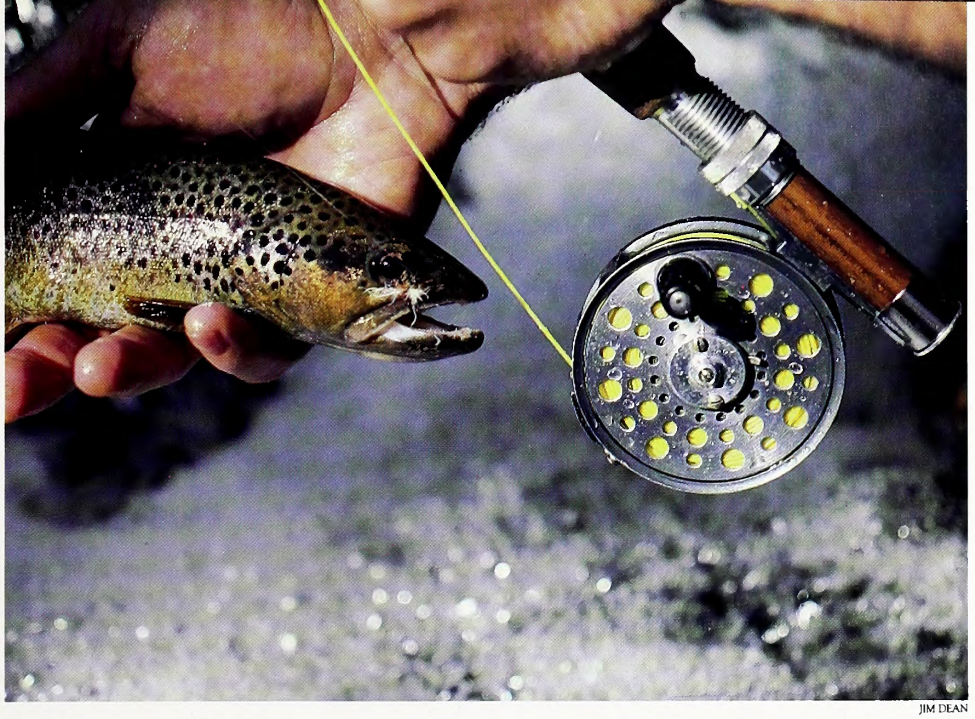
potentially acidic compounds like sulfur. Limestone streams and spring creeks are also well-buffered. Unfortunately, North Carolina has very little granite or limestone. Sandstone and quartzite bedrock formations are more common in North Carolina, and streams that drain through watersheds dominated by these rocks have very little natural buffering capacity. These streams are now seriously at risk.

Stream acidification is a subtle, complex process that eventually ends in disaster. Once atmospheric deposition of sulfur overwhelms the natural buffering capacity of watershed soils, the potentially acidic sulfur enters stream water directly and begins to lower the pH of the stream below tolerable levels for aquatic life. Acid deposition also releases high levels of toxic inorganic aluminum into streams. Favorable pH levels vary widely for different species and different local conditions, but the sequence of mortality is well-known and well-documented.

Below a pH of 6.0 to 6.5, dace, minnows and shiners (*Cyprinid* fishes) disappear from a stream. Below a pH of 6.0, other forage fish species such as darters and sculpins are lost, and the complex food web of aquatic insects —the mayflies, stoneflies, and caddisflies familiar to the fisherman—is disrupted. Smallmouth bass and trout populations begin to be affected when pH dips below 6.0. Below a pH of 5.5, a smallmouth bass cannot exist, and trout do not survive below a pH of 5.0. Rainbow trout are the most sensitive to acidification; brook trout, the least.

Even in streams with pH levels above 6.0, fish species and aquatic insect populations are vulnerable to temporary increases of acidity caused by storms and snow melts. Both chronic and periodic acidic stresses affect the spawning behavior of trout, reproduction rates, growth, food availability, the health of adult fish (and therefore their resistance to predation) and their survival to spawning age. It's a vicious cycle that eventually destroys the normal ecology of a trout stream.

These effects have already been documented. Significant loss of wild trout habitat and populations have already been reported in Pennsylvania and West Virginia, which receive high loads of sulfur deposition. Wild trout habitat is more sensitive than stocked waters, but in Pennsylvania even some previously stocked streams have become too acidic to exist even as put-and-take fisheries. In Virginia, at least one wilderness trout stream —the St. Marys—is in biological decline because of acid deposition. Researchers at the University of Virginia, who have intensively studied the problem in that state, have determined that "atmospheric deposition of sulfur and nitrogen is acidifying streams" in the mid-Appalachians from Maryland to



JIM DEAN

***As North Carolina's mountain** streams acidify, wild trout populations will be one of the most important natural resources at risk. Acid rain threatens not only fish like this handsome wild brown trout (above), but the entire stream ecosystem.*

Virginia, and that "biological damage is occuring in...acidic streams due to high levels of inorganic aluminum and low pH." Even non-acidic streams, they suspect, are subject to episodes of acidification during heavy rains or sudden snow melts. The U.S. Forest Service has documented at least one such episode in George Washington National Forest in Virginia.

Since North Carolina's mountains receive the same sulfur deposition loads as western Virginia, and since the geological profile of

> "North Carolina's headwater trout streams, which harbor populations of native brook trout as well as naturalized rainbow and brown trout, are one of the most important wildlife resources at risk."

many of its watersheds is identical to acidifying streams just to the north, it is not surprising that many of North Carolina's trout streams, from the Blue Ridge to the Smokies, are considered extremely vulnerable to the biological effects of acid deposition.

The Environmental Protection Agency's National Stream Survey has identified the southern Appalachians as an area of potential concern. The EPA began studying the southern Blue Ridge in 1985 as part of the National Acid Precipitation Assessment Program (NAPAP). Although few (2 percent) of the headwater streams surveyed were already acidic, the majority (84 percent) were found to be sensitive to acidification. Streams and lakes determined by the EPA to be extremely sensitive to acidification "were abundant in the Interior Southeast."

Although Southeastern mountain streams were, in terms of geology and stream chemistry, as vulnerable to biological decline as streams to the north, where such declines have been documented, the EPA found few streams with low pH levels. This is not surprising given the ability of soils in many parts of the Southeast to buffer sulfates. The EPA found "widespread" sulfate absorption in southern Appalachian watersheds. However, concern was expressed that the soils would soon reach their capacity to buffer sulfates, meaning streams soon could become acidic. The EPA also confirmed that, except where acidic Anakeesta bedrock intrudes, the sulfate in Southeastern soils comes from man-made atmospheric pollution, not from organic sources.

The most recent NAPAP findings, often misreported by the national media and misused by utility-industry lobbyists, confirm previous studies in the Smokies and southern Blue Ridge that many headwater streams are, in fact, on the brink of biological disaster. There is, however, disagreement about the immediacy of the danger and what needs

to be done.

Speaking before the Southern Appalachian Man and Biosphere Conference in Gatlinburg, Tenn., in November of 1991, James R. Webb of the University of Virginia's Department of Environmental Sciences made three important points on the subject of acid deposition in the Southeast. First, "that the streams of the southern half of the Appalachian mountain chain are extremely sensitive to the effects of atmospheric acidity." Second, "that the 1990 Clean Air Act cannot be counted on to stop the acidification process in the region." And third, that NAPAP findings for the region are somewhat "misleading" and "biased." Because of their random sampling technique and generalized summary of the data—which averages very sensitive and less sensitive reaches of streams—NAPAP's conclusions are only a "conservative assessment of the nature of the problem," Webb said. After 12 years of his own research, he finds NAPAP's assessment "not adequate for characterizing" what is happening to the chemistry of mountain streams in their upper reaches. In other words, wild trout in headwaters are simultaneously our most valuable trout resource and also the one most at risk.

For Webb and others, the 1990 Clean Air Act did not go far enough. Webb's intensive studies in Virginia, which concentrated exclusively on native brook trout habitat, argue for greater reductions in sulfur emissions. Although the new legislation mandated a 42 percent reduction in sulfur emissions by the year 2000, researchers at Penn State University as well as the West Virginia and Maryland departments of Natural Resources also insist that deeper cuts in sulfur emissions must be made to protect this resource. Even if the new law is properly implemented and rigorously enforced by the current administration, acidification of southern Appalachian trout streams will continue (although at a slower rate), and loss of habitat and fish populations is inevitable.

The upshot is that regional and state land managers are caught in the middle trying to protect natural resources threatened by air pollution over which they have no direct control.

Jim Borawa, trout biologist for the N.C. Wildlife Resources Commission, is very concerned. Although he doesn't have hard evidence of permanent population losses, Borawa has identified areas with low fish populations and has "no doubt that we have had impacts from acid precipitation." There have been several documented acid-related fish kills on the Cherokee Reservation.

"We know that acid precipitation does impact fish populations, and we are concerned," says Borawa. "But if we are in a slow decline in our wild trout populations, we don't have accurate measurements to compare what we have today with what we had 20 years ago."

What North Carolina has today is up to 4,000 miles of valuable trout water, with about half of it under state management. Of this, approximately 1,100 miles are managed as wild trout water, including a remnant 200 miles of native brook trout water. Air quality, a regional and national issue, is far beyond the control of Borawa and other managers on the ground. "We would welcome," he notes with emphasis, "*any* improvement in air quality and water quality that would protect our trout resource."

Steve Moore, fisheries biologist for the Great Smoky Mountains National Park, is also concerned. Moore and his crew are struggling to protect a scant 150 miles of native brook trout water, some of it containing what are probably the only genetically pure southern Appalachian brook trout in existence.

> "...it is not surprising that many of North Carolina's trout streams, from the Blue Ridge to the Smokies, are considered extremely vulnerable to the biological effects of acid deposition."

Another 900 miles or so of water in the park hold wild rainbow and brown trout.

The park also harbors other important cold-water species, as well as three federally endangered fish species—the Smoky Mountain madtom, the yellowfin madtom, and the spotfin chub. Moore has seen some evidence of pH depressions following rains and elevated aluminum levels in high elevation streams. He has not seen a loss of fish populations or habitat yet. He is, however, well aware of what is happening to the north and knows that deposition loads are heavy in the Smokies. Average rainfall pH at the end of 1991, he notes, was between 4.0 and 4.2, about 20 times more acidic than "normal" (pre-industrial) precipitation.

At the end of last year, concern was great enough to begin an inventory and monitoring program in Great Smoky Mountains National Park later in 1992, Moore said. The park has bid successfully to become one of only four national parks in the country to set up a continuous stream network monitoring system. Three in-stream hydrolabs will be set up, giving Moore and other park researchers a data base from which to measure changes in stream chemistry.

***Some of the most threatened** trout stream waters are those found in tiny headwater streams in the higher elevations of the southern Appalachians. These pristine headwaters provide refuges for the South's diminishing populations of brook trout.*

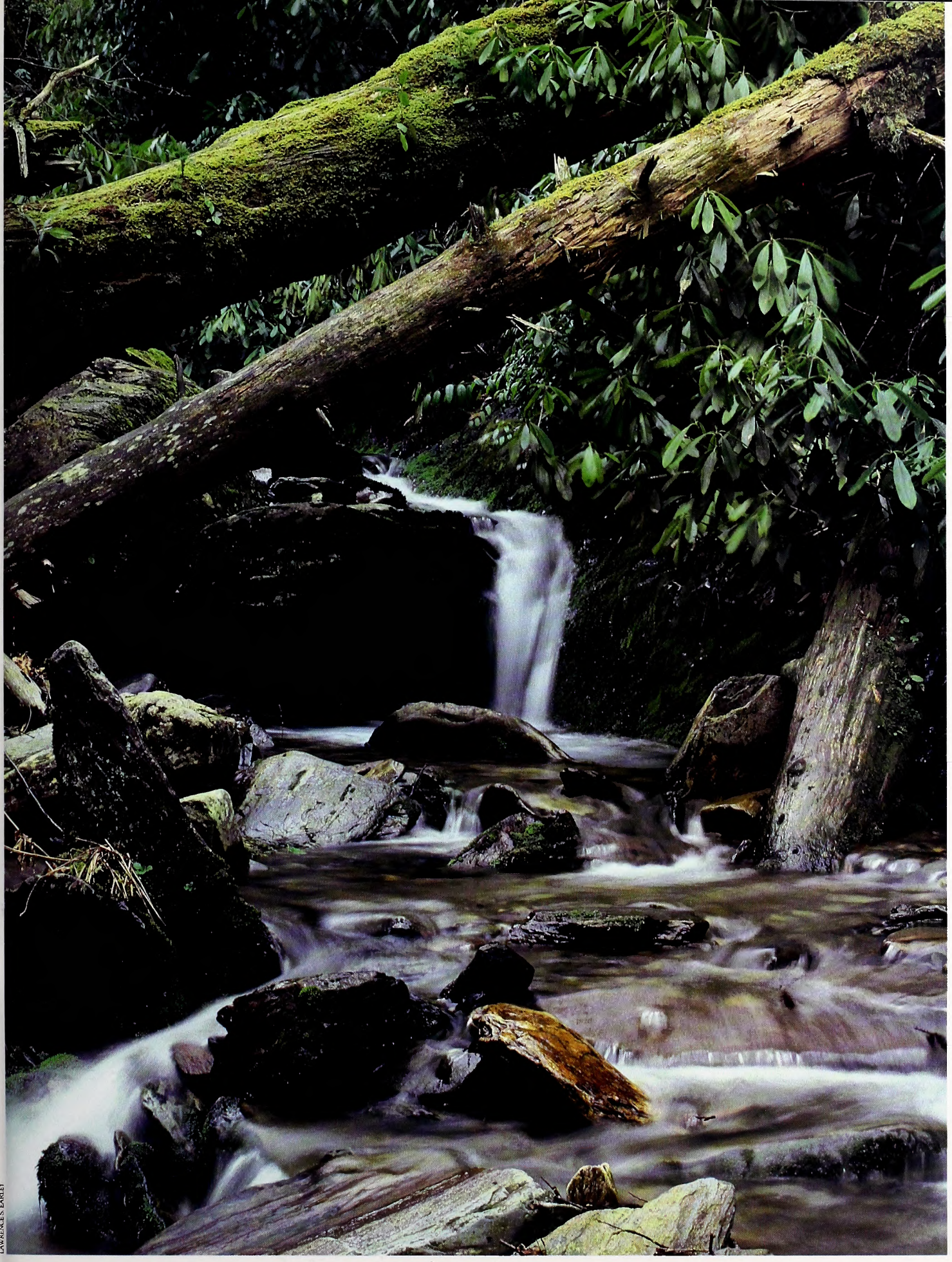
Despite the updated Clean Air Act of 1990, proposed new emission sources continue to pose a threat to streams and other natural resources. In November 1991, James Ridenour, director of the National Park Service, issued a "preliminary determination of adverse impact" for Tennesseee Eastman Company's proposed addition of a large coal-fired boiler at its Kingsport, Tenn., complex. Regional NPS Director James Coleman asserted that, under current pollution levels, "visibility is severely degraded, and vegetation is being injured. Soil and water resources (in the park) are at serious risk." Ridenour noted that, under the Clean Air Act, in its original and amended form, "most national parks and some wilderness areas are Class I, meaning that no significant deterioration of air quality or park resources is to be permitted."

But construction of and proposals for new emissions sources in the Southeast keep adding to the problem, while the park service is saying that *any* additional air pollution could be disastrous.

It turns out that the streams once thought to have the most protection from man's influence are the most vulnerable. One wouldn't think, while flicking a dry fly under a rhododendron branch toward a rising wild brown trout in the Pisgah National Forest, that anything was wrong. You can't *see* anything except the beauty of an undisturbed watershed while you fish a woolly bugger or a small spinner under the whitewater of a Smoky Mountain stream. And releasing a native southern Appalachian brook trout back to the cold water of a Nantahala Forest creek seems proof positive that all's well in the boondocks.

But the remoteness and pristine appearance of a southern Appalachian trout stream is deceiving. Wild trout need unpolluted air as well as clear, free-flowing water. It remains to be seen whether they have a secure future in the southern Appalachians. ☒

*Christopher Camuto, the author of* A Fly Fisherman's Blue Ridge *(New York: Henry Holt, 1990), is a writer and photographer living in Buena Vista, Virginia.*



LAWRENCE S. EARLEY

BRAD HERNDON

# TURKEY TAG

by Joel Vance ©1992

I thought of calling this game I'm in Trivial Pursuit, but that name was taken. Call it Turkey Tag. Five days into the season and I have been one step behind a gobbler every morning. I am *It*, looking fruitlessly for the other players in the game. Think of my turkey woods as a 100-acre game board.

It is a wood lot, surrounded by large open fields. So the turkeys are contained, pieces to be maneuvered and manipulated, as only I, the master gamesman, can do it. I have planned strategy for months, yodeling on a mouth call until my perts and putts are as perfect as those of a randy old hen in the woods. I can yelp so heartbreakingly that gobblers will come from adjacent states to sooth my inflamed passions.

I am ready.

Think of turkey hunting as a gigantic board game, one in which the human player is very likely to be gobbled alive.

DAY ONE: Experience shows that anywhere from one to a dozen turkeys roost in the upper right-hand corner of the woods. On the gameboard, this is "Go." The idea is for me to find a spot on the board where I can greet the turkeys after they leave their roosts and begin their daily rounds. This goal is complicated by the fact that they aren't wedded to a specific roost, nor do they follow predictable routes when they leave it.

This time, however, I have scouted so well I can make the hike in my sleep, except for a certain barbed wire fence, a confounded blowdown, a snarl of vines and a couple of viciously armed briers.

I creep in at 5 a.m., more than an hour before daylight. There is method here: turkeys are in deep sleep, not prone to alarm. Also, I forgot daylight savings time and got up an hour early.

I am a cat burglar, silent as fog, if fog falls over a blowdown and says things that you normally find written on the restroom walls of rural alehouses. There is no moon, an overcast that makes the night as dark as the inside of a bat's weskit. I find a comfortable tree with no more than the usual number of sharp stobs poking me in the back.

I contemplate the sanity of those who rise in the night to sit in the cold, lonely woods on sharp rocks.

A tree across the trail looks softer than the one I'm impaled on and I rise and take two steps. A sharp "Puck!" freezes me. I slowly raise my head and see a dark blob about 15 yards up. Roosted turkey. I've obviously made a slight miscalculation. Escaping prisoners feel this way when the spotlights go on and the warden shouts, "Don't move, Rocky! We got you covered!"

I tiptoe back to my original tree and sit as the string of clucks trails off. Perhaps the bird will forget about it by dawn. Perhaps I will inherit a million dollars today.

When it becomes light, I see three roosted birds, including one with a beard as long as his memory. A fourth begins to gobble, just out of sight, and a fifth is yelping to the other side. I am in a roost. This is frowned on by experts, but I think there is no way I can avoid killing a turkey.

If either of the two gobblers I know are there flies down on my side of the trees, it will be within range and within sight and I will exclaim "You're *It*!" with my Model 12 full choke.

All the turkeys fly down, one by one into the woods, the center of the game board, 200 yards away. They do turkey things there, paying absolutely no attention to my impassioned calling. Go directly to jail, do not pass Go, nor collect $200.

***To hens and hunters,*** *a wild turkey gobbler in full strut is an impressive sight. During the season, however, the camouflaged stalker often begins to suspect that this proud puffery is staged merely for the benefit of photographers.*

BRAD HERNDON

***In the soft morning light,*** *a gobbler listens for the seductive invitation of a hen. What this bearded bird is also likely to hear at times are the hopeful notes of a hunter who has driven his family half mad over the past few months learning to imitate a love-sick hen. You think this wary bird can't tell the difference?*

DAY TWO: My knowledge of the game board leads me to believe the birds of opening day flew to an old field to play a different game. If I set up an ambush there among some scrub cedars, I will be trampled by cavorting turkeys.

Once again, I stumble through the dark woods, fighting the same tangling strands of vine I did on opening day, ripping my already tattered camouflage coveralls on the same fence, tripping over the same deadfall.

I bypass the roost, tiptoing as if sneaking by the housemother. I feel my way along the edge of the woods, cut through a barely glimpsed opening, and find myself in the old field. The only good hiding tree proves to be a honey locust, as I discover when I lean against it in the dark. It's like being mugged by a knife-wielding Berber.

The whippoorwills rush to explain themselves before daylight. Finally it is light enough for the gobblers to declaim. They do—exactly where they'd roosted on opening day, 200 yards up the hill, at Go. Ah, but they will fly right into my arms and I will tag one....

Fly-down time comes and the gobbling continues. Right up the hill, where I was the day before. Go directly to jail, do not pass Go, do not collect $200.

"Oh, fudge!" I exclaim petulantly.

DAY THREE: I battle grimly through the vines and the fence and the blowdown, leaving shreds of camouflage and me on the spiky protrusions. I am losing my sense of fun, not to mention composure and skin. Tag is only fun when you don't have to be *It* all the time.

I crouch and wait. There is a dark blob in the next tree over and it has the oval shape of a turkey's body. Have I blundered into the roost again? Good heavens, it isn't 10 yards away. Can it be? I see it outlined by stars, a patriotic turkey, a celestial body. If it is a gobbler, it is so close that its beard will be touching my head. I wait for daylight, finger on the safety.

It grows lighter... and the turkey resolves itself into a twisted limb. I relax my twisted limbs and brood. The first gobble is down the hill, in the old field where I was yesterday. Two others answer him and they discuss something, probably my ineptitude. We carry on high-level negotiations, but nothing comes of it. Turkey Tag is like the United Nations—much talk and little action.

DAY FOUR: A new element is added to the fun of Turkey Tag today. In addition to the sprout whips, thorns, fence barbs, blowdowns and ticks (have I mentioned ticks—they are my constant companions, so afraid of getting lost in the woods that they cling to me like, well, like ticks), it is now raining. It's not a frog choker because then I wouldn't go. It's just hard enough to soak me, but not hard enough to discourage me.

I follow a new route so I can slink into the woods at the corner where the two gobblers were yesterday. Optimism like this hasn't been seen since Job, at the peak of his troubles, said, "Isn't life great!"

I wait for light, drizzle leaking down my neck, chill seeping right to the core. It is light enough for gobbling, but all I hear is a cardinal. Cardinals are eternal optimists.

***Here is the frequent player** of Turkey Tag, resplendent in camouflage and at last taking aim on his quarry. But no, he has been outsmarted again. This is the old "pretending to shoot" pose staged at the request of the photographer.*

LLOYD B. HILL

Rain? What rain? It's *beautiful* out! Stupid birds. What am I? A human redbird?

No gobbles from my corner of the woods, but there is a sudden loud shot from the roost area. Another hunter has come into the game and tagged a gobbler. I remain *It*.

DAY FIVE: This no longer seems like a game; it's a vendetta. The rain has blown out and there are stars above me as I settle comfortably into the heart of a greenbrier. My whine of pain sounds like a hen's muted love whimper... or so I hope.

A Canada goose bellows in the night—night and day are all the same to a goose. A turkey, roused from deep sleep, gobbles even before the first hint of dawn. I decide to move down the hill so I can be in a more likely landing zone when he leaves his tree.

I skulk 75 yards through the brush, making no more noise than a rhino, and find another soft rock to sit on. Half an hour later, a gobbler sounds off no more than 35 yards behind me. I probably walked under his tree. He knows I am present. He doesn't care. He is out of sight in the brush and king of all he surveys.

I speak to him, saying things that would embarrass mixed company. He seems to agree, replying, "Sounds good to me!' and we talk for perhaps 30 minutes, until it is time for him to fly down. I rub the safety, heart thumping. Now is the moment I leap out of hiding and put the tag on the other player in the game.

He doesn't fly down, he flies *way* down, 60 feet over my head, sailing to join his early-bird brother. Together they make the woods ring. I'd like to wring their necks.

DAY SIX: Okay, now we've cleared the impedimenta out of the way, made all the mistakes, gotten the bugs out, now we're ready to kill a gobbler.

You can run, turkeys, but you can't hide. Rambo Vance is afoot and he is peeved. I am at the corner of the game board, poised, slimy mouth call at the ready, as gray tinges the eastern sky. I have three potential tags tucked in the chamber of the old Winchester, each with more than one ounce of No. 4 shot.

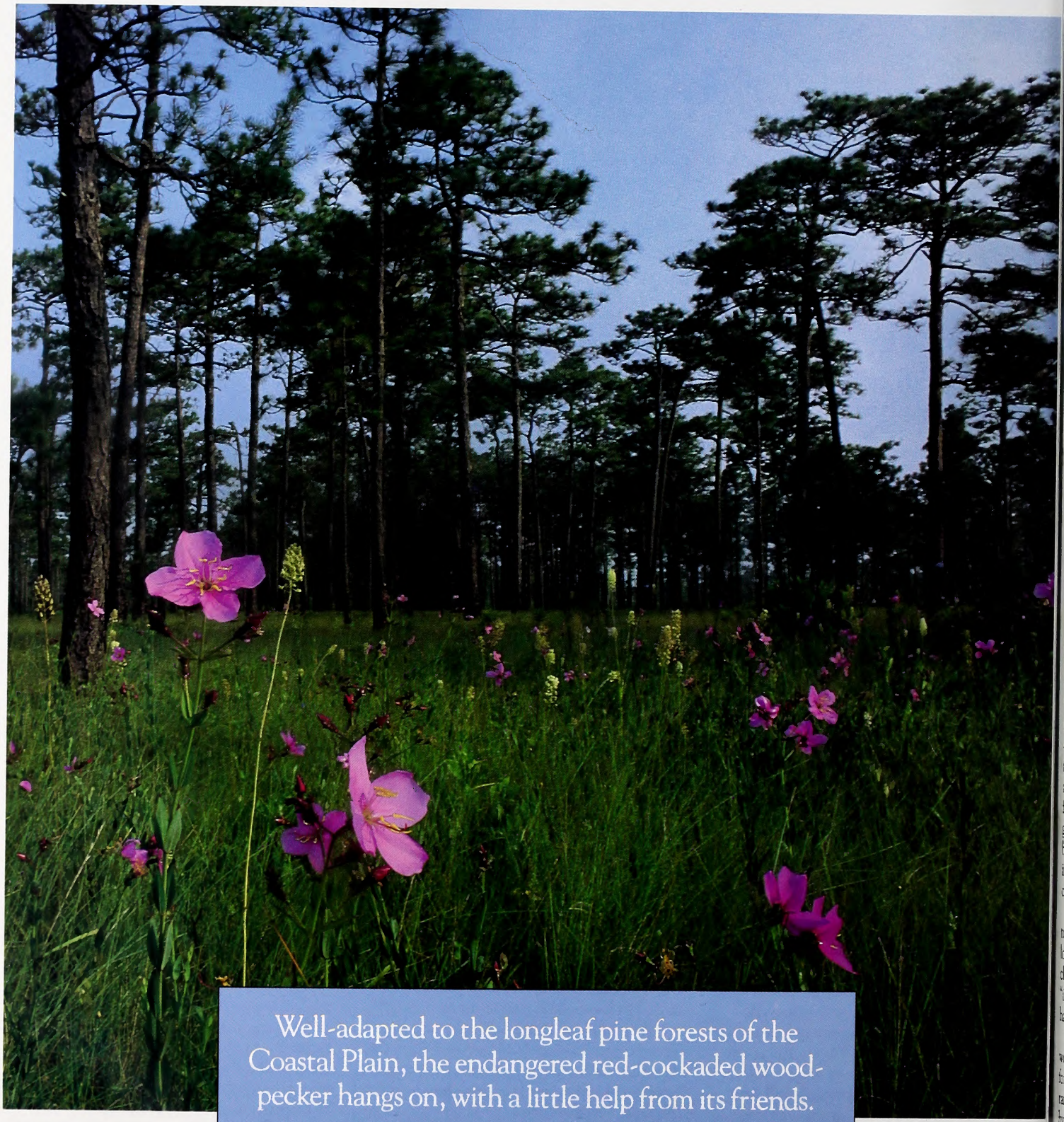
A gobbler sounds off, down the hill, and I resolve to do something I'd resolved not to do: move toward the gobbler. If he won't come to me, I'll go to him. The leaves are muted by heavy dew. I get to my feet, groaning like an octogenarian, and take one step. There is a shockingly loud "boom!" from the direction of the turkey and then I hear two hunters discussing at the top of their voice the joys of getting a bird.

So much for the solitude of the turkey woods. I'm tired of being *It*. I'm going to take my ball and go home. I'm through with this game of trivial pursuit. I know all the questions, but none of the answers. The guy down the hill who shot—he got Boardwalk; I can't even acquire Baltic Avenue.

I'm not going to play anymore.

At least not until tomorrow morning.... ☒

# *Ghosts of the* PINELANDS



Well-adapted to the longleaf pine forests of the Coastal Plain, the endangered red-cockaded woodpecker hangs on, with a little help from its friends.

written by Garnet Bass ©1992
photographed by
Derrick Hamrick ©1992

The tree begged for attention. A rust-colored belt of smooth bark encircled it about 40 feet up. Sap ran glistening over the belt and around a cavity in the middle. All in all, it resembled nothing so much as a well-burned candle, a comparison often made. And its message resounded throughout the forest: RED-COCKADED WOODPECKER LIVES HERE.

Looking at it, Norman Lantz recalled working as a forester 30-plus years ago in Florida. Back then, he tagged longleaf pines like this for the ax. They were worthless. Get them out. Make way for valuable timber.

Today Lantz, wildlife forester for the N.C. Wildlife Resources Commission, tags these trees for a different reason. To save them. And by saving them, to save their inhabitant and creator of the candle, the red-cockaded woodpecker, from extinction.

Throughout Eastern North Carolina, agencies charged with overseeing the red-cockaded woodpecker's habitat—from the Army and the U.S. Forest Service to the Wildlife Commission—are shifting policies and practices to promote its recovery. Others, such as the N.C. Department of Transportation, seek ways to avoid potential harm to its habitat. Among private citizens, too, the woodpecker's friends are growing—in some cases, growing new longleaf pine forests. No one's claiming victory from these signs, but many are encouraged.

***Five hundred years ago,*** when the New World interfered with Christopher Columbus's voyage to the Orient, the red-cockaded woodpecker needed no help. Up to 90 million acres of old-growth longleaf pine forests blanketed what is now the Southeastern United States. Perhaps yearly, lightning ignited wildfires that consumed dead wood and undergrowth. The longleaf, resistant to fire, thrived. And wherever the longleaf pine grew, the red-cockaded woodpecker made a home. It was the most common woodpecker in the Southeast and one of the most common birds.

Then other white men followed Columbus to the New World. They chopped down the longleaf pine for fields and timber. Later they cleared it to make way for towns, roads and "improved," fast-growing loblolly pines. Perhaps worst of all, they suppressed fire.

The longleaf pine and the red-cockaded woodpecker dwindled. Today, the longleaf forest covers less than a tenth of its former range, and red-cockaded woodpeckers, even by the most optimistic estimates, number fewer than 10,000. Like the trees, the birds are scattered in small pockets of Sandhills and coastal plains from North Carolina to East Texas. On Oct. 13, 1970, they gained an entry on the federal Rare and Endangered Species List.

In North Carolina, fewer than 1,500 individuals remain. They live mostly on public lands: Fort Bragg, the Sandhills Game Land, the Croatan National Forest, the Holly Shelter Game Land, Camp Lejeune, and a few others. The Sandhills population—encompassing birds of the Sandhills Game Land, Fort Bragg, Weymouth Woods State Park, and private lands in Moore County—today may be the second largest in the country. Yet it probably numbers fewer than 1,000 birds—less than a viable population.

According to the U.S. Fish and Wildlife Service, the agency in charge of listing and recovery of most federally recognized endangered species, the long-term survival of the red-cockaded woodpecker hangs on its meeting four requirements:

- open pine forests,
- old-growth trees for cavities,
- large tracts of foraging habitat, and
- several nearby clans for population stability and genetic variation.

On all four counts, the red-cockaded woodpecker is in trouble.

***Twelve pairs of eyes*** strained to spot the source of the rapping. "There it is," came the shout. Twelve pairs of binoculars followed the pointing finger. High in a longleaf pine 75 yards away, a red-cockaded woodpecker scattered bark in search of insects underneath. The Green Swamp, a Nature Conservancy preserve in southeastern North Carolina, had yielded a prize.

It was a small prize—measuring about 7½ inches and weighing two ounces—with a black and white ladderback pattern on the back and white patches on the cheeks. Females lack the red spot on the rear of the head that earns the red-cockaded its name. But even on a male, it seldom shows unless a challenging male riles his dander.

The red-cockaded woodpecker, also known as RCW, is a rare bird in more than its official listing. It is the only woodpecker that drills its cavities in living trees—a tough task and an obvious adaptation to the forest's natural fire regime. It is also one of only three cooperative breeders in North America. It lives in clans that consist of one breeding pair, the current year's fledglings, and one to seven adult male "helpers" from previous nestings.

When the species was plentiful and saturated the forest, evolution gave the edge to the stay-at-home type who helped raise, feed and protect the family. Eventually Pop might die and leave the family territory to one of them, or a neighboring territory might come

***Meadow beauties bloom*** *in this longleaf pine savanna in the Croatan National Forest (left). The blue band on a distant pine indicates a tree with a red-cockaded woodpecker nest. A red-cockaded woodpecker (above) feeds its hungry, 26-day-old nestling. These woodpeckers prefer cavities excavated in older, living longleaf pines.*

***A field technician** at Fort Bragg covers the woodpecker cavity with his hand to calm a nestling so it can be more easily caught for banding. The shadow over the cavity entrance makes the baby woodpecker think its parent is present. Banding and other studies help biologists learn more about the complicated life cycle of the red cockaded woodpecker.*

open. In the meantime, it was safer at home than wandering in search of breeding grounds of its own.

Except for the new arrivals, each clan member roosts in its own cavity. For cavities, the RCW selects trees at least 80 years old for their large heartwood. If it's lucky, it'll find one infected with heartrot, which simplifies excavation.

It can take a bird, or several working together, up to five years to drill a cavity. Two years is about average. The fastest driller on record spent 10 months on one cavity. Unlike other woodpeckers, which drill new cavities each year, the RCW uses its hard-earned home for several years.

Routine maintenance gives cavity trees their candlelike appearance. The bird chips the bark down to a smooth, rust-colored finish and drills a series of resin holes. It keeps the sap runny by regularly pecking at the holes. Scientists debate whether the housekeeping measures serve as protection from predators, identification, or a warning to trespassers.

To raise young successfully, the clan needs at least 100 acres of foraging habitat full of beetles, worms and spiders. If the habitat isn't good and nests start to fail, the female will move on in search of a better home. The male will hang on. One male in the Sandhills lived alone in a declining habitat for seven years, defending it against encroachers till he died.

"Males are so stubborn and so attached to a cluster of cavity trees that there's almost nothing that will make them leave, short of cutting down the trees," said Phil Doerr, a biologist from N.C. State University. "That has obvious implications for health and reproduction."

Doerr is a member of an NCSU research team that has "written the book" on red-cockadeds, in the estimation of at least one Forest Service biologist. In the past 10 to 15 years, Doerr, Jeff Walters and Jay Carter have introduced a series of major findings on the RCW. Among the most significant were population models (designed with Mike Reed) that established the first standard for the size of a viable population and the results of experiments with artificial cavities that are now being used throughout the Southeast.

The population modeling grew out of concerns that the small, scattered populations of RCWs would suffer from inbreeding unless ways could be found to introduce genetic diversity. The Fish and Wildlife Service cited the study when it informed the Army two years ago that activities at Fort Bragg threatened the Sandhills population. One of the concerns was that RCWs on the base and those on the Sandhills Game Land and in Moore County seldom exchanged breeding members.

It referred to the population studies again when it set terms for its approval of plans to widen U.S. 15-501 between Aberdeen and Pinehurst. The highway will cut through the edge of two RCW clans' foraging territories. To reduce harm to the overall population, the N.C. Department of Transportation hired Jay Carter to create four new colony sites where they have the potential to help close the eight-mile gap between RCWs on Fort Bragg and the game land. Among the tools Carter used were artificial cavities.

The cavities began as a way to answer a question. They've resulted in population-saving first aid.

For nine years, the NCSU team followed about 250 clans of RCWs scattered around 250,000 acres of the Sandhills. In all that time, they recorded only one new territory. Even seemingly suitable habitat stood vacant while eligible helpers babysat for Mom and Dad. Yet if a neighboring male died without an heir, one of the helpers would claim the territory before the body hit the ground.

Did existing cavities make the difference? To test the theory, the NCSU researchers and their students learned to drill cavities closely resembling the RCW's own. They established small colonies of artificial cavities in uninhabited but promising territory. Then they waited.

But not long. Quickly, new families set up housekeeping in 18 out of 20 of the colonies. Existing cavities indeed were the key to expanding territory.

The work proved timely. Shortly after they announced their findings, Hugo destroyed 60 percent of RCW cavity trees in the Francis Marion National Forest in South Carolina, and artificial cavities received a full-scale, life-or-death test. Today, the Francis Marion RCW population is rebounding, and artificial cavities are being adopted as a management tool across the RCW's range.

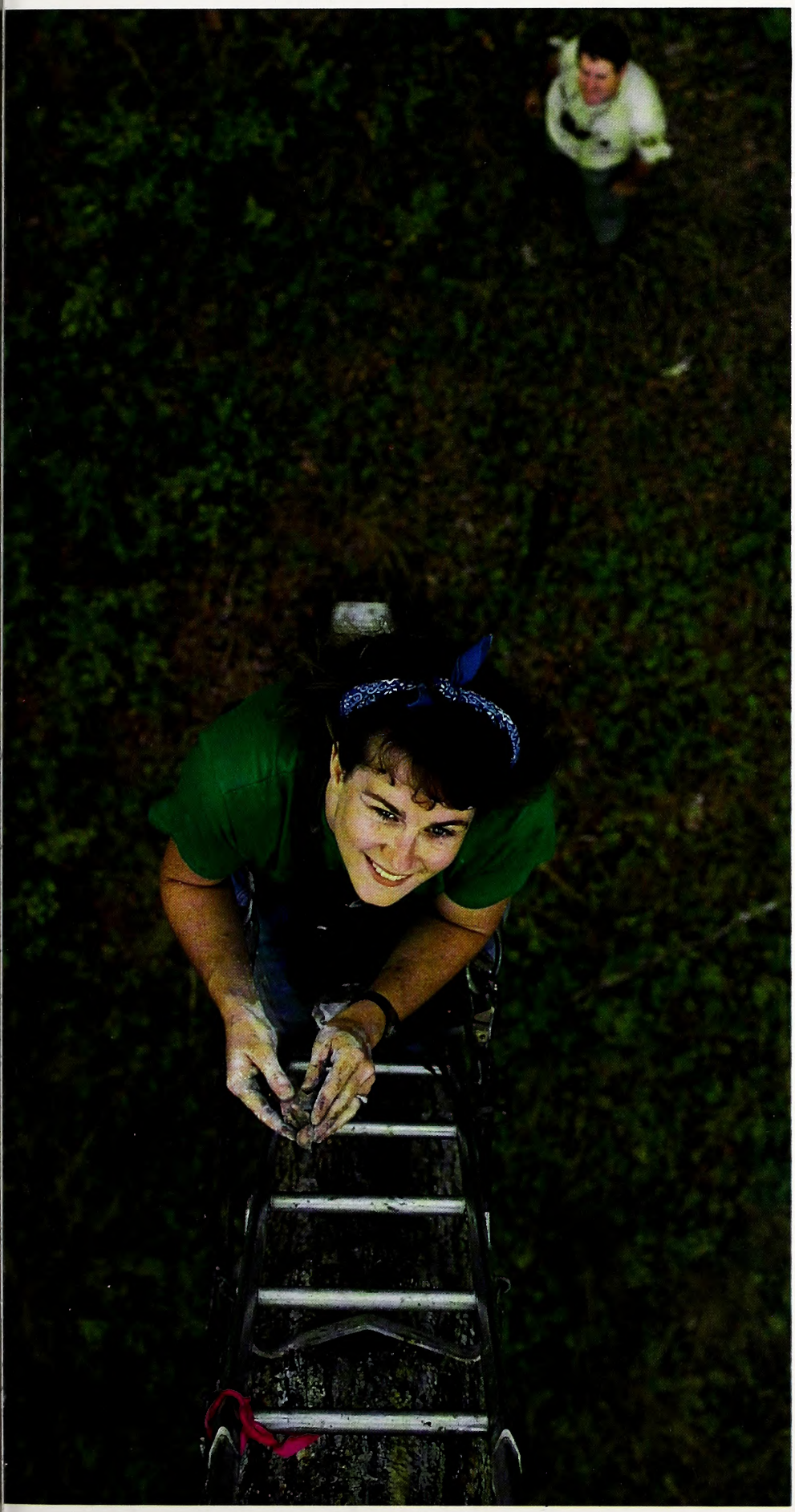
"Because of what we've learned about management and biology and why they do certain things, we can save the red-cockaded woodpecker," Doerr said. "I think by and large scientists and managers know what to do, but it will take commitment on the part of certain agencies. I'm really not convinced there's that level of commitment."

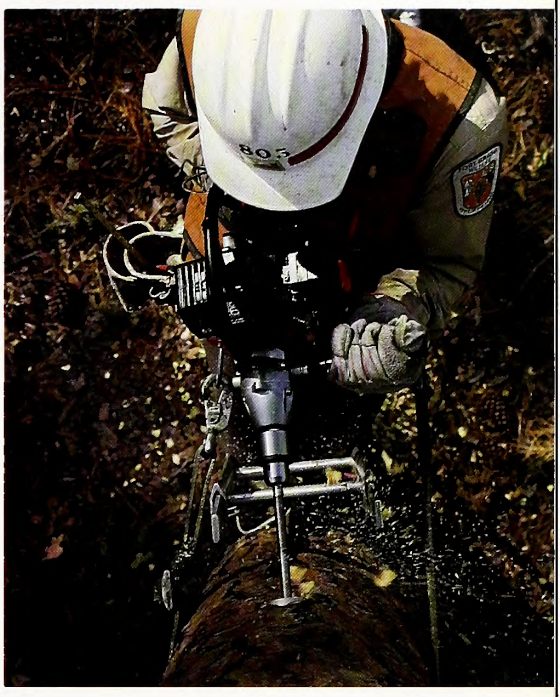
***Norman Lantz and his longtime*** right hand, wildlife technician Bill Parsons, seem to know every acre of the 83-square-mile Sandhills Game Land, which is owned by the state, managed by the N.C. Wildlife Resources Commission, and heavily used by the Army for training exercises. Jostling over dirt paths, Lantz and Parsons point out areas where turkey oaks grow thick and tall beneath the longleaf pine, and others where regular burning keeps the forest floor clear except for knee-high wiregrass.

They stop to show off a cavity tree woodpeckers had abandoned when the oaks grew too high. Afraid a fire here would burn too hot, they brought in prison labor to clear the brush by hand for 50 feet around. Now a woodpecker has returned.

Soon a habitat inventory will guide their work beyond the cavity trees. "When we get through with the inventory, we'll know what we need to do for foraging habitat," Lantz said.

Even noble intentions can be difficult to carry through. To protect the species, many foresters must reorient themselves to longer rotations and selective harvesting to ensure foraging and nesting habitat for years to come. Inclinations to douse fires must be brushed aside. Not only is fire good and





***A technician prepares** to return a young woodpecker to its 30-foot-high cavity in the Croatan National Forest (left). Above, another technician drills an artificial cavity in a longleaf pine at Fort Bragg. Biologists have found that the birds will accept such cavities and that small populations can even be moved by this method.*

necessary for proper longleaf forest maintenance, but regular summer fires—the cause of many a forester's nightmare—are best because they catch hardwood saplings when they're most susceptible.

Some agencies find their primary missions challenged by RCWs. For most of its existence, the Forest Service has served a mandate to manage and harvest the national forests. Only in the 1960s was the mandate altered to include multiple uses. For other agencies—such as the military and state and federal highway departments—protecting endangered species seems even further removed from their traditional concerns.

The Endangered Species Act requires federal agencies and any project using federal money to protect listed species and to aid their recovery. Yet a federal judge in 1988 had to order the Forest Service to protect RCWs in national forests in East Texas. Here in North Carolina, the Environmental Defense Fund and Sierra Club Legal Defense Fund have threatened to sue the Army over the destruction of habitat on Fort Bragg.

But progress is being made, both where the law dictates and where it doesn't. In an effort to develop a uniform red-cockaded management policy, the Department of Defense

## RCWs and Roads

On a project-by-project basis, the N.C. Department of Transportation is probably involved in more tussles over red-cockaded woodpeckers than any other state agency. Mitigation efforts recently resolved a hold-up over plans to widen U.S. 15-501.

B.J. O'Quinn, assistant director for planning and environment, said he was pleased with the agreement worked out through the U.S. Highway Administration and the USFWS. "Going through the process was very painful, but the mitigation efforts were positive," he said.

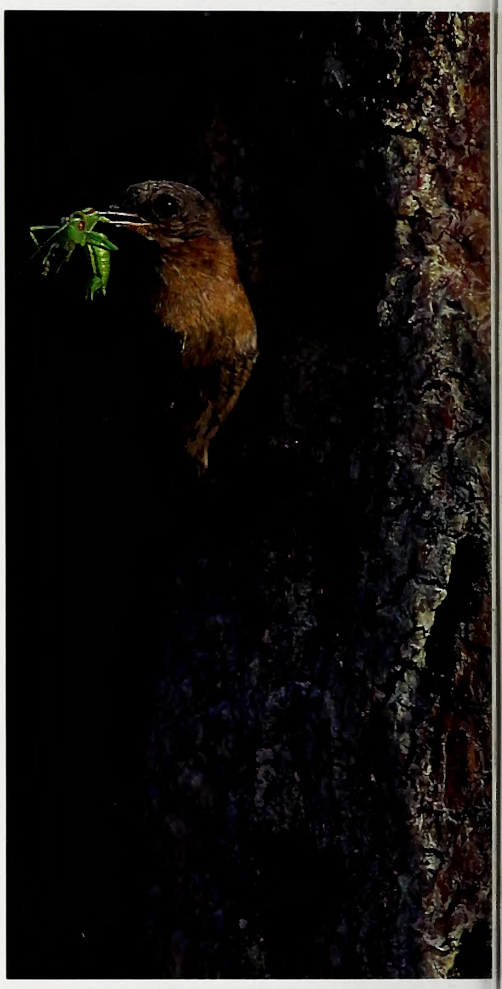
Even when projects don't involve federal money, he said DOT consults with USFWS informally on protection of federally listed endangered species. He described a multi-step process the department goes through to try to avoid woodpecker habitat, but noted three upcoming projects in which conflict seems inevitable:

- The bypass around Havelock, which is locked in on one side by Camp Lejeune and the other by the Croatan National Forest.
- A new connector through the Sandhills between I-95 and Fort Bragg. The department developed three alternative designs to try to avoid the woodpecker. But along one stretch the designs affect foraging habitat.
- A bypass around Spring Lake in Moore County.

O'Quinn acknowledged that highways often decrease potential habitat for an endangered species even when they avoid cavity trees and foraging areas. "Every longleaf pine you cut decreases potential habitat," he said. "We do our part taking out habitat, but so do shopping centers, schools, and so forth. Or go back to our friends in the forest industry who say no more long rotations.

"It's everyone's fault, like so many other things." Since 1978, DOT has expanded its cultural and environmental planning staff considerably—doubling it to 26 in the past three years alone. That is in part because of a legislative mandate to speed road-building.

But O'Quinn said the department's approach is also different. "We've matured in the ways we deal with environmental matters," he said. "In the early days, we focused on compliance, doing what we had to do. Today, the adminstration and the secretary are very pro-active. Environmental issues are very important to us."



***A female bluebird** fetches a brilliantly colored katydid to its nestlings in a former red-cockaded woodpecker cavity. Flying squirrels, bluebirds and great-crested flycatchers are among the forest creatures that compete for the woodpecker's cavities.*

hosted a two-day workshop last spring at Camp Lejeune. The Forest Service, which across the region controls the majority of RCW habitat, has prepared an environmental impact statement that establishes RCW management policies more stringent than USFWS guidelines. It expects to circulate the document for public opinion this spring. Meanwhile, the forests operate under interim guidelines. In North Carolina, the staff of the Wildlife Commission has prepared RCW management guidelines for the Commission's review. In addition to the Sandhills Game Land, the Commission oversees three smaller game lands on the coast with RCW populations.

In advance of formal guidelines, these agencies and others already are beginning work on RCW recovery, but they have much to overcome. "The trend is getting better on select public lands," said NCSU's Jay Carter. "But we won't be able to tell if it's a general and lasting trend for several years."

At Fort Bragg, the rigors of troop training have severely strained the RCW population. In its advisory opinion, the Fish and Wildlife Service said tracked vehicles had damaged numerous cavity and foraging trees. It also cited cases where soldiers had dug bivouacs in RCW habitat and cut down cavity trees to retrieve parachutes. More than 200 colony sites at Fort Bragg and nearby Camp Mackall, a training area for Special Forces troops, suffered from midstory encroachment, it said.

The EDF notice of intent to sue in 1990 cited many of those same concerns. The Persian Gulf war interrupted initial negotiations, which had led to a draft endangered species management plan, and in January of this year, EDF asked the base commander for a progress report. "Our hope is that the Army will respond by carrying out commitments already made," said attorney Michael Bean, chairman of EDF's wildlife program. "If not, we will consider all options available to us, including following through with the suit."

Terry Myers, civilian chief of Fort Bragg's endangered species branch, said other required reports have waylaid progress on the management plan, but improvements to RCW habitat have stepped up nonetheless. He cited natural inventories, midstory removal and use of artificial cavities as examples. His staff and the Fish and Wildlife Service also are working with base planners to secure a forested corridor connecting fragmented RCW populations, and violations during training exercises apparently are down.

"We get quite a few calls about parachutes in trees," Myers said. "That's a good sign. It means they aren't cutting trees down or tearing off limbs to get parachutes."

Mike Gantt, director of the USFWS Raleigh Field Office, said the base has made a lot of progress in the last two years. "We've certainly seen a lot of improvements, but it doesn't mean we're there yet. A lot needs to be done."

Both the Wildlife Commission and the Forest Service include rotations of more than 100 years and selective thinning of foraging trees in their plans. The woodpeckers prefer open stands, and with less competition, the trees will grow faster and stronger.

"In the past, many people have been discouraged from doing any type of timber managment on their land where RCWs exist," said David Allen, biologist with the Wildlife Resources Commission. "That's the wrong way to go about it. Woodpecker management can be used in conjunction with good forestry practice."

***Red-cockadeds can surprise*** a lot of people, in part because they're fairly tolerant of human activity. Housing developments and

***A controlled burn** at Fort Bragg normally does not harm longleaf pine trees but it does reduce the build-up of fuel on the ground. Regular burning is an essential tool in maintaining high-quality red-cockaded woodpecker habitat. Without fire, the open pine-land grows over in dense thickets of scrub oaks and the woodpeckers find it difficult to fly and feed.*

golf courses around Southern Pines and Pinehurst provide homes for many. Evidently, the manicured lawns and widely spaced trees provide an adequate substitute for the open forest.

Phil Doerr recalled one nesting tree next to a driveway. All coexisted peacefully until one year the family held a garage sale. "That was more than the birds could stand," Doerr said. "They didn't feed all day, and the nest failed."

Federal law prohibits the "taking" of an endangered species, which would include cutting cavity trees. In the Sandhills, some developers grumble about RCWs, but Carter said it's usually not difficult to have birds and developments if the birds' needs are taken into account early on.

"The horror stories come where people get involved in land transactions not knowing RCWs are present and then plan developments and find they're plowing right into the middle of a colony," he said.

Despite their compatibility with development and forestry management, RCWs continue to suffer from intentional and careless human activity. Three to four landowners a year are fined for removing cavity trees. Recently, a Pender County landowner clear-cut 1,000 acres of longleaf forest. Because USFWS agents couldn't prove he had knowingly destroyed RCW habitat, they could do little.

Other landowners are more hospitable. A Moore County couple plan to manage their 100-acre holding for longleaf pines and the RCW, and the growing market for pine straw is making some farmers reconsider what they're planting. Robert Harrington, forestry extension agent for Richmond, Scotland and Montgomery counties, said in his area about 1,500 acres of mostly new longleaf pine forests are being planted every year.

The new acreage clearly doesn't replace all that's been lost. It may take decades to determine whether all of the public and private efforts combined will be enough to recover the red-cockaded woodpecker and one day remove it from the endangered species list.

"As far as maintaining extant populations, almost certainly some groups will not survive," Carter said. "But we now have the ability to create cavities, and we can move birds around. We may be able to restore some lost populations or increase populations of existing groups. There's more hope than there was five years ago. The real question is whether we have the political will to do that." ☒


## You Make a Difference!

NORTH CAROLINA NONGAME & ENDANGERED WILDLIFE FUND

Each year, North Carolina residents may check a line on their state income tax refund and designate any or all of their refund to the Nongame and Endangered Wildlife Fund. Since 1983, your donations have raised almost $3 million to protect and manage species that are threatened, endangered or of special concern. Your support has meant that many endangered species have a chance for survival. Make your contribution directly or through the income tax checkoff to the Nongame & Endangered Wildlife Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27604-1188.

*Anniversary Celebration Set for May 9*

# Nature Conservancy to Hold Open House at Green Swamp

*Written and Edited by Vic Venters*

Since its inception in 1977, the North Carolina chapter of The Nature Conservancy has protected over 337,000 acres of critical wildlife and rare natural habitat in the state. On May 9, the Conservancy will celebrate its 15th anniversary in the state with an open house at its Green Swamp nature preserve.

The Green Swamp comprises 15,722 acres in Brunswick County and is one of only eight National Natural Landmarks in the state. The swamp preserve contains many rare, endangered and threatened plant and animal species and is one of the last strongholds for fire-dependent Coastal Plain ecosystems such as pine savannas. In some areas of the Green Swamp, as many as 50 species are found within one square meter. The preserve was protected through a gift from Federal Paper Board.

The main event for the open house will be held at Brunswick Community College located near the town of Supply. The events at the open house will include music and refreshments, environmental education activities for children, exhibits on the Conservancy and the Green Swamp preserve, and slide shows.

There will also be a shuttle service to transport visitors to the Green Swamp preserve for guided field trips. Topics covered in the field trips will include fire-maintained ecosystems, rare species management, wetlands issues, plant poaching and endangered longleaf pine communities.

The Conservancy currently owns and manages 50 preserves in North Carolina totalling over 32,000 acres of natural habitat. The remaining 305,000 acres the Conservancy has preserved has been turned over to public ownership in the form of national and state parks, wildlife refuges and gamelands.

The Nature Conservancy works in close cooperation with the state's Natural Heritage Program to identify and inventory unique natural areas or habitats. The Conservancy then establishes protection priorities based on the information gathered by the Heritage Program and volunteer consultants.

The Conservancy protects land primarily through gifts or purchases, but it also uses conservation easements, leases, lease/options and voluntary agreements between landowners.

In June, the Conservancy will hold another open house celebration centered around Nags Head Woods on the Outer Banks. Nags Head Woods consists of 722 acres of ancient dunes, maritime forests, pine hammocks and freshwater ponds.

For more information on the open houses, contact the North Carolina Nature Conservancy, Carr Mill, Suite D-12, Carrboro, 27510, or call (919) 967-7007.

R.K. PEET

***Green Swamp Gala:*** *In celebration of its 15th anniversary, the N.C. Nature Conservancy will hold an open house at its Green Swamp nature preserve in Brunswick County. The 15,772-acre natural area is one of only eight National Natural Landmarks in the state and is home to an astounding variety of rare or threatened wildlife and plant species. Pictured above is the Big Island Savanna area, a fire-dependent longleaf pine wetlands area.*

*Harvest to be Delayed on Four Streams*

## New Regulations in Effect on Mountain Trout Streams

Before you head to your favorite trout stream this spring, be sure to check specific regulations for the stream that you will be fishing. New or altered regulations will be in effect on many streams. The regulation changes are part of the N.C. Wildlife Resources Commission's recent Trout Management Plan that calls for diversifying angling opportunities.

One of the most notable regulations to change this year will be the implementation of delayed harvest on sections of four trout streams. The delayed harvest regulations will be in effect on the following waters: the Nantahala River between the CP&L powerhouse and Whiteoak Creek; Jacob Fork in South Mountains State Park; the Ararat River from SR 1727 downstream to SR 1759, Surry County; and the East Prong of the Roaring River in Stone Mountain State Park.

Between March 1 and June 5, these waters will be stocked, but only catch-and-release and single-hook artificial lures will be allowed. On June 6, the regulations on these four streams will revert to the hatchery-supported designation (stocked), with natural bait and a creel limit of seven fish allowed.

"These delayed-harvest streams really offer anglers the best of both worlds," explained Jim Borowa, the Wildlife Commission's trout program manager. "They offer accessible water to those just interested in catching fish, and as the season progresses, we allow harvests, too."

"In the past, many anglers visiting stocked trout streams have found them barren because the trout were quickly harvested," Borawa said. "Our objective is to provide anglers with a few streams where they can have a good opportunity to catch fish. This type of regulation has proven very popular in Pennsylvania and Virginia."

Because stocked trout are easier to catch than wild streambred trout, the delayed-harvest waters should be ideal training grounds for novice fly fishermen or casual fishermen.

Since fish are not being harvested between March 1 and June 5, catch rates should be maintained at higher levels than in other hatchery-supported streams where a harvest is allowed. To examine how effective these new regulations are, biologists with the Wildlife Commission will be conducting creel surveys on the affected portions of the Nantahala River and East Prong of the Roaring River. For comparison, adjacent sections where normal hatchery-supported regulations are in effect will also be surveyed.

To prevent confusion on the part of anglers, informational signs will be posted in the delayed-harvest sections. These will be in addition to the normal regulation signs.

Another major change in trout regulations will be the reclassification of trout waters on gamelands in District 9.

Beginning July 1, streams on gamelands not specifically designated as hatchery-supported waters (stocked) will automatically be reclassified as wild trout waters.

Last year, the Wildlife Commission reclassified streams in this manner in districts 7 and 8. This year, District 9 was added. The new classification will protect wild trout populations from over-harvesting, especially vulnerable brook trout populations.

STEVEN A. WILSON

***Fishing For Fun:*** *Delayed harvest regulations on four trout streams this spring will permit catch-and-release fishing until June 5. After that, the streams revert to regular hatchery-supported (stocked) status. The new regulations should provide high catch rates for anglers.*

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before travelling to an event. Listings for this calendar should be conservation-oriented and should be sent at least four months in advance.

**April 8-12**

The 22nd annual Grifton Shad Festival will feature over 25 events. For more information, write Grifton Shad Festival, P.O. Box 928, Grifton, N.C. 28530, or call (919) 524-4536.

**April 11-12**

The 1992 Coastal Celebration at the N.C. State Fairgrounds in Raleigh. The two-day event is part of the "Save Our Sounds" project and will feature environmental educational exhibits, seafood concessions, contests and more. Sponsored by the N.C. Coastal Federation and WRAL-TV. For more information, contact "Save Our Sounds" at (919) 821-8790.

**April 22**

Earth Day 1992. Check your local paper for state-wide events.

*Will Help Farmers and Wildlife*

## Fact Sheets Available on Pesticide Use on Crops

A new series of fact sheets on pesticides are now available that will help landowners and farmers select and use specific pesticides to minimize negative impacts on wildlife. The fact sheets will cover pesticide use with soybeans, corn, tobacco, cotton, peanuts, small grains, fruit trees and Christmas trees.

Each fact sheet will be devoted to one of the above named crops and will provide a detailed evaluation of pesticide alternatives available. The fact sheets advise pesticide use within the concept of Integrated Pest Management, which is the use of a specific pesticide for a specific pest, rather than the wholesale application of very powerful universal pesticides that can kill or harm a broad range of organisms—including wildlife.

The fact sheets were produced in response to concerns about declining small game and other farm wildlife populations and the role pesticides are playing in those declines. In addition to specific wildlife concerns such as bobwhite quail declines, there are also larger questions about how pesticides and other agricultural chemicals are affecting the entire farm environment.

"These fact sheets are targeted for farmers and were designed to be easy to use with the Integrated Pest Management concept," explained Dr. Pete Bromley, a wildlife ecology professor at N. C. State University who is heading the pesticide program. "Instead of going out and spraying everything with a particularly high-powered pesticide, the farmer is encouraged to look at where in the field the problem is and then to determine if the problem warrants a pesticide application. If the farmer decides treatment is necessary, then he can look in his fact sheet, and pick out the most workable option that may be least toxic to wildlife."

The sheets were produced as part of a cooperative project between the N.C. Wildlife Resources Commission and Cooperative Extension Service at N.C. State University. The principal author of the fact sheets is William E. Palmer, a graduate student and doctoral candidate working with Dr. Bromley.

The release of the fact sheets this spring is the first phase of a larger project designed to study pesticide effects on wildlife. Later in 1992, the sheets will be supported by a comprehensive publication on pesticide-wildlife relationships. The researchers are also initiating a major field study to compare treated and untreated wildlife farm populations.

To obtain free copies of the fact sheets, or for more information, contact Cooperative Extension Service, P.O. Box 8003, Raleigh, N.C. 27695-8003.

DEBBIE CONGER

***Farming For Wildlife:*** *A series of fact sheets released this spring is designed to give farmers information that will encourage them to use crop pesticides that minimize negative impacts on farm wildlife. The fact sheets are part of a joint pesticide project by the Cooperative Extension Service and the Wildlife Commission.*

## Expert Tips on Turkey Hunting

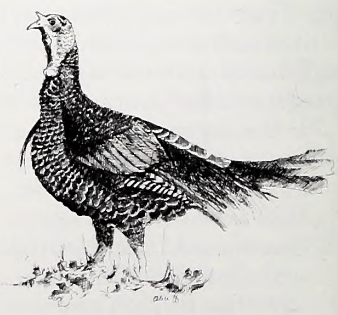
As wild turkeys continue to make a successful comeback in North Carolina, interest in hunting the species continues to grow. Beginning or novice turkey hunters in North Carolina may find a recently published booklet, *How to Successfully Hunt the Spring Gobbler*, an excellent reference for getting started.

Although only 28 pages, this self-published booklet is crammed with tips on calling, camouflage and concealment, and scouting and hunting tactics applicable to the spring turkey hunter in North Carolina.

Written by veteran turkey hunter J. Van Sharpe, the booklet is based on the author's 35 years of wild turkey hunting experience in North Carolina. The author was also aided by Pat Brady, another longtime turkey hunter who took the North Carolina state record gobbler in Rockingham County.

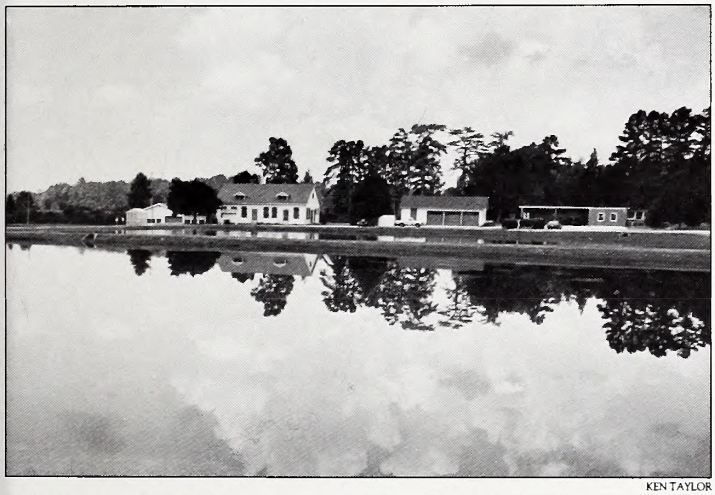
One note: If you're looking for stunning photography, fluffy writing and elaborate production, buy another booklet, as this publication focuses on specific how-to information and tips. It is illustrated with black and white photography and simple, but effective, line drawings.

Copies of *How To Successfully Hunt the Spring Gobbler* are available from the author for $5 postpaid. Send to J. Van Sharpe, P.O. Box 14, Wentworth, N.C. 27375.



*Warmwater Fish Production to Increase*

## Commission Buys New Fish Hatchery



KEN TAYLOR

***Fish Factory:*** *With the recent acquisition of the Watha Fish Hatchery in Pender County, the Wildlife Commission estimates that it will be able to raise warmwater fish production by more than 1 million fish per year. The new hatchery has about 55 acres of water compared to 10 acres at the old Fayetteville hatchery. Lake Rim (pictured above) at Fayetteville will be managed as a public fishing area.*

This spring, the N.C. Wildlife Resources Commission purchased the 278-acre Watha Fish Hatchery in Pender County for about $1.1 million. Included in the deal were the 1.3 million fish in stock at the hatchery.

Although additional funds will be spent on improving the Watha facility, the total price will be far below the estimated $8 million that it would have cost to build a state-of-the-art hatchery on Commission gamelands in Butner.

With its new hatchery, the Wildlife Commission's Division of Inland Fisheries and Boating expects that it will be able to increase its warmwater fish production by an estimated one million fish per year.

For several years, the Wildlife Commission has needed a new hatchery for warmwater species. The old hatchery, located in Fayetteville, was too small to meet growing hatchery needs and there was no space available for expansion. It was also plagued by water quality problems, in part caused by development in its watershed. The Fayetteville Hatchery will be converted into a Commission depot and work center. Lake Rim at the Fayetteville hatchery will be managed by the Commission as a public fishing area.

The Fayetteville hatchery had only 10 acres of water available for operations, while the Watha hatchery has about 55 acres available. In a consolidation of operations, the Commission also closed the Weldon Fish Hatchery in Halifax County where striped bass have been hatched since the late 1800s. The Commission moved its striped bass production to Watha.

Fish culturists will now raise striped bass, channel catfish, largemouth bass, Bodie bass, bluegill, bluegill hybrids and redear sunfish at the Watha Fish Hatchery.

Currently, the Commission produces about 600,000 striped bass fingerlings a year. Commission officials expect to double the number of striped bass when they begin production at the new hatchery.

## Sportsmen's Alliance Address Correction

In the February issue of *Wildlife in North Carolina*, an incorrect address was printed for the North Carolina Sportsmen's Alliance. The Alliance is a new group founded to promote the rights of ethical sportsmen in North Carolina. The Alliance is the first group formed in the state solely for this purpose. Since its formation one year ago, the Alliance has been very active in promoting pro-hunting legislation. If you are interested in joining, contact them at the address listed below.

The correct address is: North Carolina Sportsmen's Alliance, P.O. Box 31163, Raleigh, N.C. 27612, or call (919) 781-4570.

### Field Notes

| | |
|---|---|
| Hatchery-supported trout waters | Opens April 4 (7 a.m.) |
| Wild turkey (bearded birds only) | April 11-May 9 |

Special regulations such as delayed harvest, artificial lures-only, creel and size restrictions apply on some trout waters. Check the *1991-92 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest* for regulations pertaining to specific streams.

## Wildlife Endowment Fund Report

**Jan. 31, 1992**

Principal Balance
$16,583,859.29

Interest Earned
$8,849,534.91

Total Receipts
$25,433,394.20

Interest Used
$3,282,016.48

Fund Balance
$22,151,377.72

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

# Feeding Tips for Fish and Fowl

*by Vic Venters*

Few activities for helping wildlife are more popular than feeding. After all, who hasn't had a birdfeeder at one time or another? With anything, though, comes the responsibility to do it right.

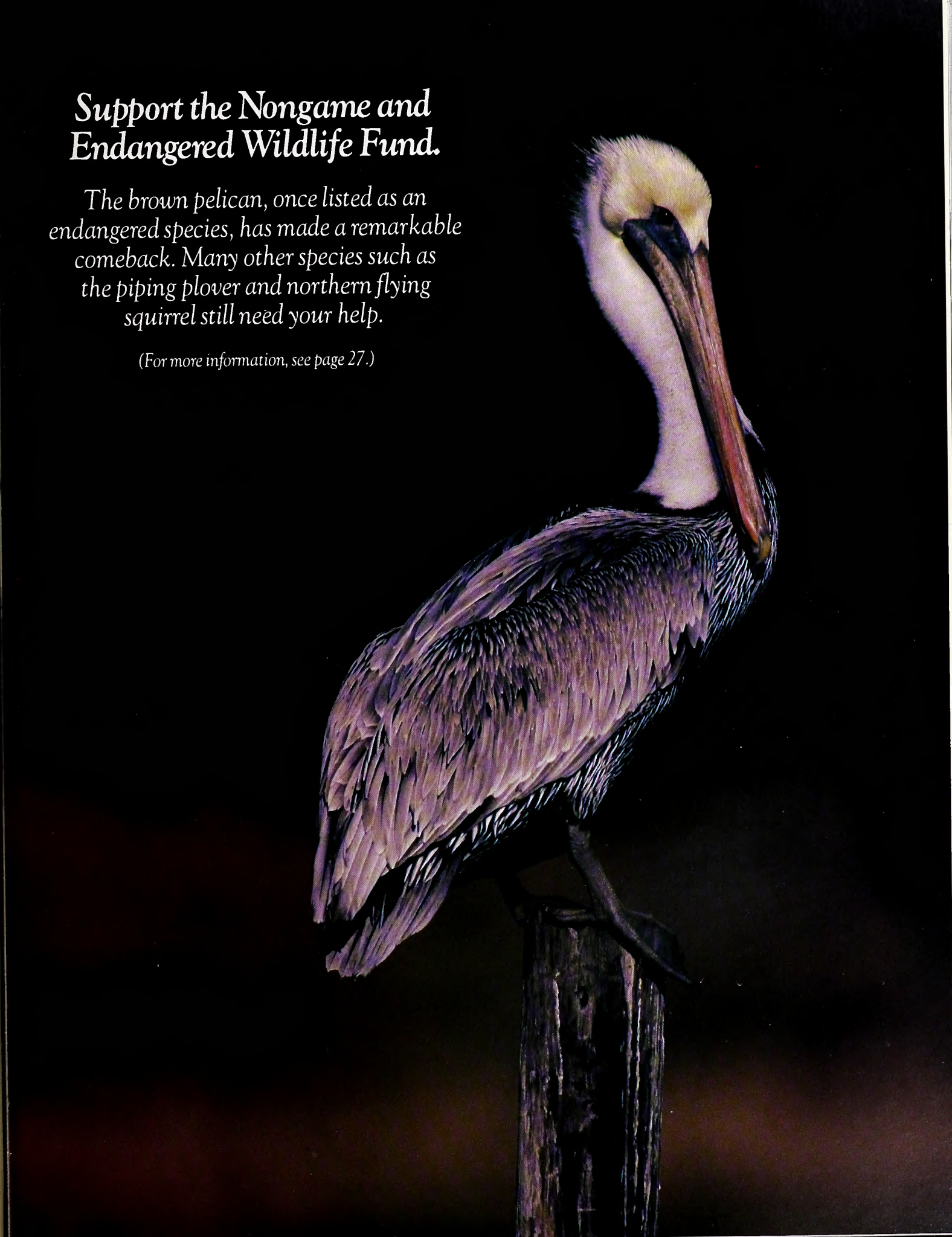
*Deadly for Doves:* Beginning last spring, bird watchers across North Carolina began reporting dead and dying doves around their birdfeeders. In some instances, people reported finding as many as a dozen doves over several months into the summer. Research on the dead birds indicated that they had died of *trichomoniasis*—a parasitic disease found in doves and pigeons. The parasite lodges in the roof of a dove's mouth, causing a growth to appear that prevents the bird from swallowing. Consequently, the disease is spread to other doves when they pick up seeds dropped by the infected birds. Doves concentrating around feeders appear particularly susceptible. The outbreak last spring was aided by damp weather, which allows the parasite to flourish. Weather patterns this spring should determine if there will be recurring outbreaks this year. If you begin observing dead doves around your feeder, you can slow the spread of the disease by temporarily taking down your feeder. Another alternative is to move your feeder to grounds that are not contaminated and monitor it closely. If you observe dead doves around feeders, please report them to the N.C. Wildlife Commission's Division of Wildlife Management at (919) 733-7291.

*Food for Fish:* Supplemental feeding is one method that can be used to increase the size of fish in your pond and can be especially useful in small, infertile waters that aren't suitable for fertilization. Commercial fish food is available in both floating and sinking varieties and can be obtained from feed stores. Begin feeding in the spring when your pond's water temperature rises above 65 F. Feed daily in several places and do not put more food out than can be consumed in about 15 minutes. However, once you begin a feeding program, you must be willing to continue it or your pond will soon hold more fish than it can naturally support, resulting in stunted fish and poor fishing. Feeding is not needed, or recommended, for fertilized ponds. For more information, contact the Division of Inland Fisheries at (919) 733-3633.

# *Support the Nongame and Endangered Wildlife Fund.*

*The brown pelican, once listed as an endangered species, has made a remarkable comeback. Many other species such as the piping plover and northern flying squirrel still need your help.*

*(For more information, see page 27.)*



## Forest in Fog

Early morning mist shrouds the trees in this old-growth forest. You may hear nothing more than the faint drip of water in this wet and silent natural cathedral.

Second-class postage paid at
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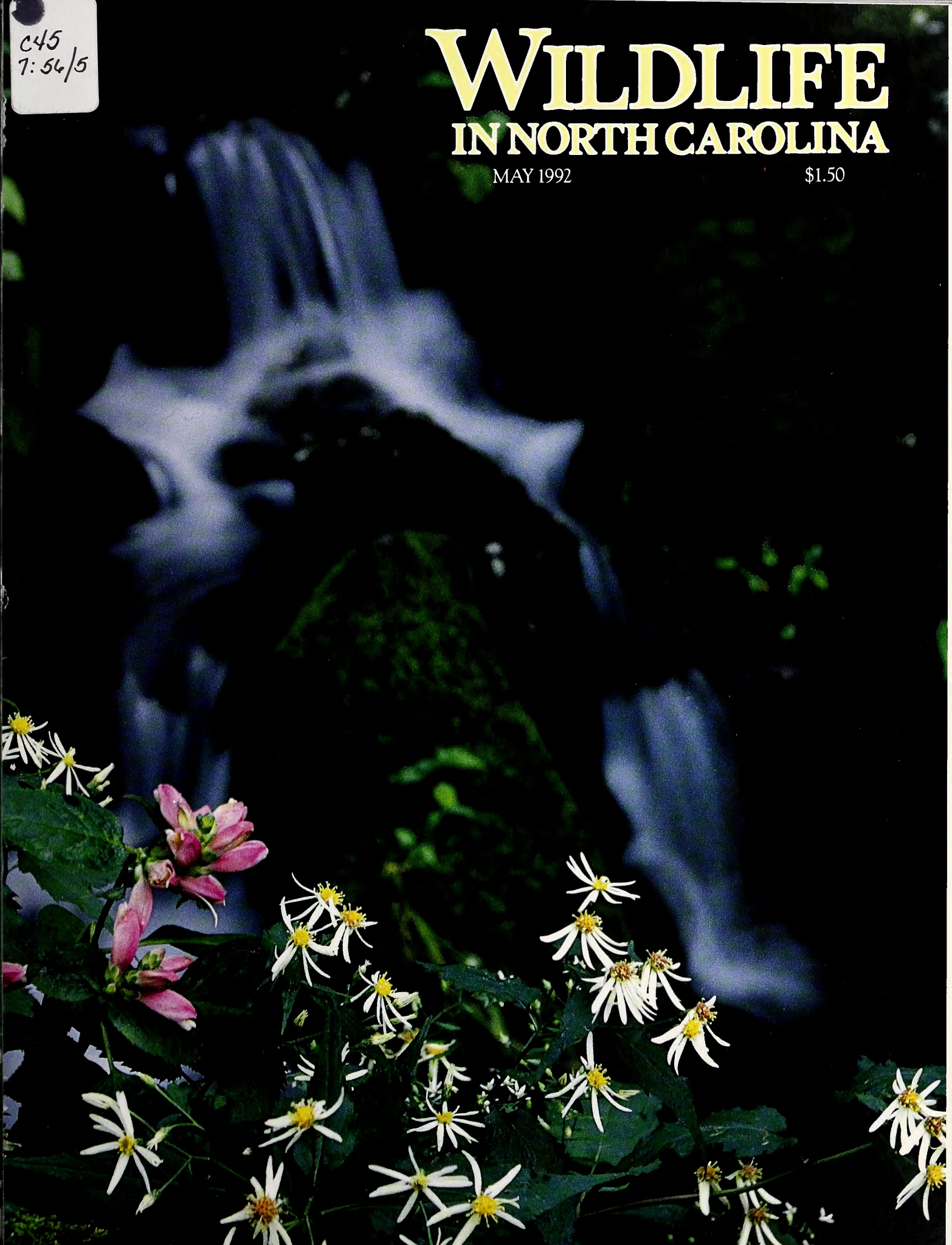
# WILDLIFE IN NORTH CAROLINA

MAY 1992 $1.50



# To Bait Or Not To Bait

*by Jim Dean*

A reader raises a provocative question. "I have recently moved to North Carolina," he writes, "and while driving through some rural areas, I have noticed several intriguing businesses that I hope you can explain. Some are advertised as worm ranches; others as cricket ranches. I'm a city slicker, and I don't understand this kind of industry. What goes on at a worm ranch? Are free-range worms herded together at appropriate times of the year and driven to market? Do worm ranches hire cowboys? Are they called wormboys (worm-persons?), wormpokes or wormpunchers? Are rodeos ever held? Do you suppose I can get a part-time job on a cricket or worm ranch?"

JIM DEAN

Okay, let's start from scratch here. As you surmised, these ranches do indeed raise worms or crickets, sometimes both. Roundup is usually held in the spring just before fishing season. Perhaps you have heard of fishing. It's what we do around these parts. As for jobs, I'm informed that you should put on your 10-gallon hat, leather vest, chaps, pointy-toed boots and spurs and mosey out to the nearest worm ranch. Chances are the foreman will hire you on the spot, most likely to help with the branding. Happy trails.

While we're on the subject of natural baits—as opposed to unnatural or supernatural baits—perhaps this is a good place to point out that some highly skilled panfishermen seldom use either red worms or crickets. This may come as a surprise considering that bluegills, shellcrackers, robin, pumpkinseeds and similar panfish rarely turn down a juicy cricket or a fresh redworm. Furthermore, both baits are readily available at reasonable prices almost everywhere. Even so, hard-core aficionados—a "fishing"ados?—swear that there are at least three other natural baits that will invariably outfish worms and crickets. In case you haven't guessed, they are fresh-water grass shrimp, catalpa worms and the unhatched larvae of the paper wasp.

The grass shrimp is a small, transluscent greenish crustacean that is found in most of the streams of the Coastal Plain, and possibly elsewhere. When I was a kid, my grandfather would frequently stop at a creek while we were on our way to one of the eastern blackwater rivers we usually fished. He carried an old seine in the trunk of his ancient Buick, and we'd wade into the creek and make a few passes with the seine. We weren't always successful, but when we could get them, grass shrimp were hard to beat for panfish.

Much the same can be said for catalpa worms (also colloquially, but inaccurately, called "Catawba" worms). These greenish, black-striped worms are about 2-inches long—similar to a tobacco worm—and are found only on catalpa trees for a relatively brief period each summer. Actually, panfish have little or no natural opportunity to eat them. Even if a tree is hanging over the water, the worms cling so tightly to leaves and twigs that I suspect they only occasionally fall into the water. Besides, when fishermen use them for bait, they pinch off the head and turn the worm inside out on the hook so that it most closely resembles a white, oblong gob of goo. That certainly doesn't resemble the live worm, yet Catalpa worms enjoy well-deserved and near-legendary status as panfish bait.

Where do you get catalpa worms? Since they're seldom offered for sale, you're pretty much on your own. If you're lucky, you might find a tree-owner who will let you pull off some worms for bait. If you want your own supply, you'll probably have to root cuttings from a catalpa (I don't know of a commercial source of trees, but such sources may exist). Obviously, waiting for a tree to grow is long-term project, but even then you aren't assured of having worms. Those who've tried this tell me the worms don't simply show up; some have to be collected from a catalpa that has worms, then placed on the tree. Once established, however, you should have a goodly supply each year as long as your trees live.

That brings us to the wasp nest business. The white larvae or grubs of immature wasps are enclosed in separate chambers in the nest. Because the young wasps are always attended by plenty of aggressive adults, most fishermen—including yours truly—avoid this bait. My friend, Mike Gaddis, has used wasp grubs, however, and he thinks they're wonderful. Apparently, you can carry a big nest with you and select a fresh bait whenever you want one—sort of like peeling the wrapper off a Tootsie Roll. Ah yes, but how does one go about obtaining a nest?

"We just gritted our teeth and went in and grabbed it," Mike says. Quickly, I'll bet. I'd be inclined to hire someone for that task, or carry a flame thrower. Maybe that's why I'm still buying crickets and worms. They don't have their own air force, and you can catch them without a lariat.

May, 1992
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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Wildlife Through the Year** *by Vic Venters*

**Cover** *White wood aster and pink turtlehead grow in the rich, damp earth alongside a waterfall on Roan Mountain, one of the many diverse habitats on this amazing peak. Photographed by Harry Ellis.*

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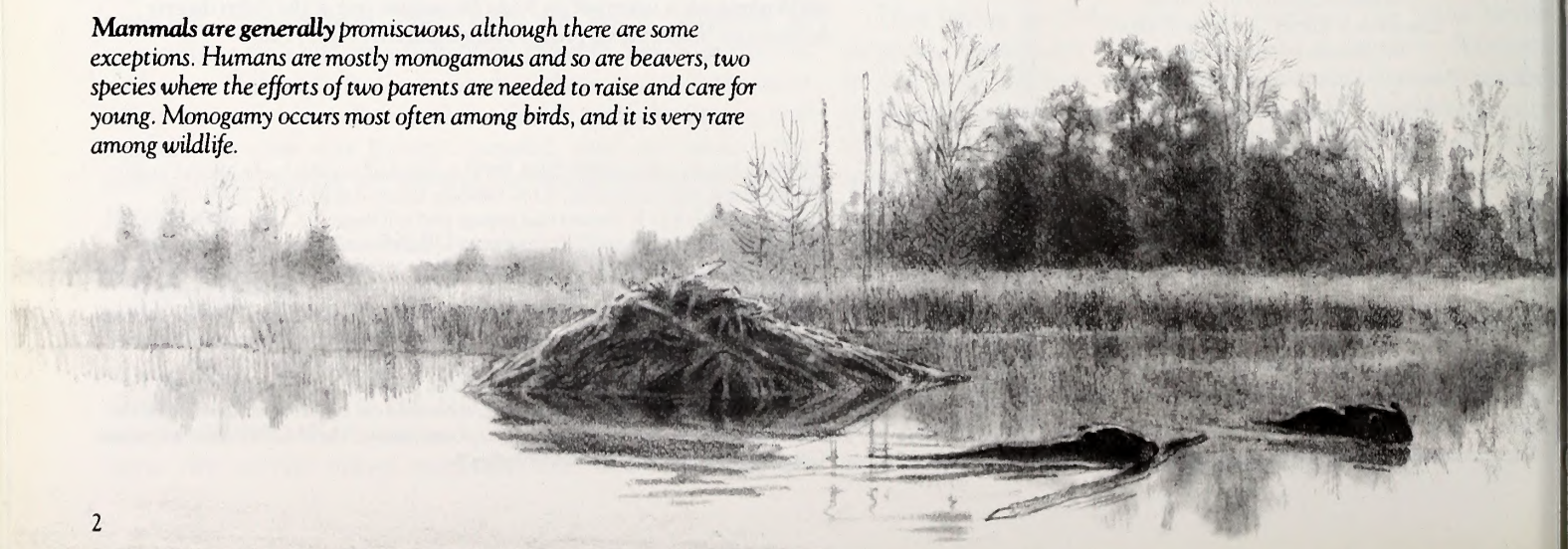
**Most mammals are** *promiscuous in their mating patterns, but a whitetail buck gathers a harem of does which he defends against other bucks. Fawns are generally all produced by the one buck. This is another example of polygyny.*

**Mammals are generally** *promiscuous, although there are some exceptions. Humans are mostly monogamous and so are beavers, two species where the efforts of two parents are needed to raise and care for young. Monogamy occurs most often among birds, and it is very rare among wildlife.*



# Taking a Mate

*written by Lawrence S. Earley/illustrated by David Williams*

Most human societies have found that a permanent bond between parents (monogamy) is not only good for children, but for society as well. Yet, in the animal world, many more species find that temporary bonds work just as well.

Even among monogamous species, there is a baffling variety of options. Males and females may be monogamous for a single season, for several seasons or, like geese and swans, they may mate for life. Monogamy seems to have developed in situations where two adults are needed to raise the young. Ninety percent of all birds are monogamous and it's easy to understand why. Both as eggs and as hatchlings, many—although not all—young birds need almost constant attention from both parents. The young would have less chance to survive if the male abandoned the female or vice versa as soon as mating was completed.

Yet most animals are *polygamous*—they mate with more than one member of the opposite sex, making temporary bonds that take several forms.

One form, exhibited by black bears and other mammals, is *promiscuity*. That's a word that comes loaded with negative human values, but what it means is that a male will mate with several receptive females and a female will mate with several males. No bond is established and the females raise their young alone. Promiscuous mating may sound random and indiscriminate, but mammals are choosy, selecting mates based on strength, size, color and other traits that signify superiority.

A much rarer mating system involving multiple mates is *polyandry*. Here the female mates with several males, but the male only mates with a single female. In North Carolina, the spotted sandpiper is a polyandrous species. The female mates with several males and lays her eggs in several nests that are tended by different males.

Of all mating systems, however, *polygyny* is the most common and it too involves multiple mates. This time the male mates with many different females, while the female mates only with a single male. Polygyny arises mostly in species where the female can raise her young alone and the help of the male is not crucial to their survival.

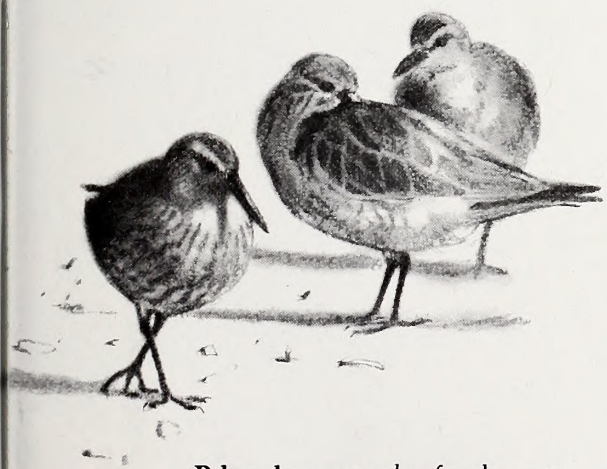
Some examples:

- **Toads.** A male toad grasps a receptive female and stimulates her to lay eggs which he fertilizes. He may do the same with three or four more females, but the female only lays her eggs once.
- **Deer.** A buck collects a harem of does which he mates with during the rut and protects from other males in the area. All the fawns born are thus fathered by a single buck.
- **Sunfish.** Bream and other sunfish exhibit a variation of polygyny. In the mud bottom of a stream or pond the male sunfish makes a depression into which several females may lay their eggs. He fertilizes the eggs and protects them.

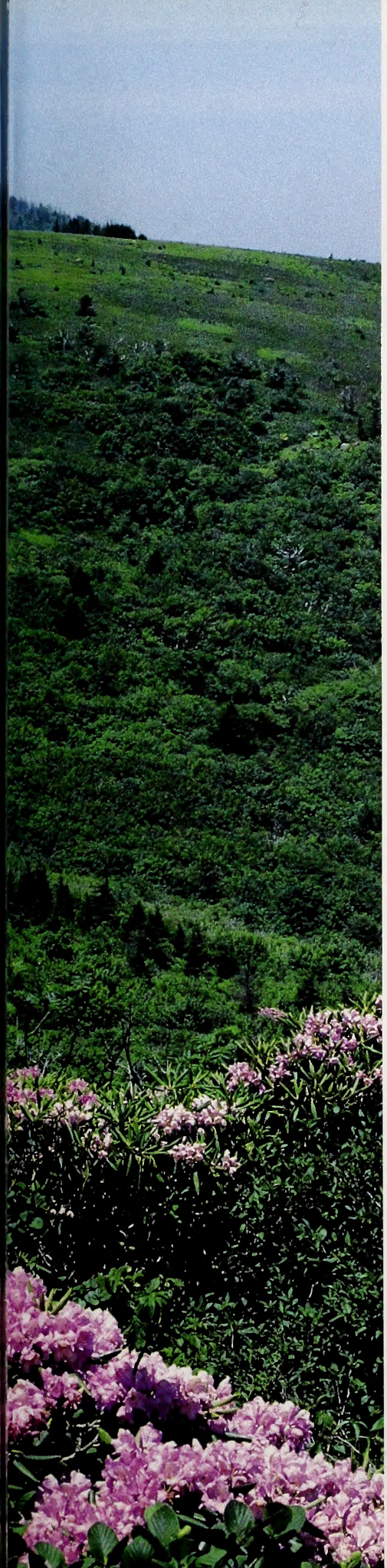
Of course, not all animals fall conveniently into these categories. Though most birds are monogamous, polygyny can arise especially in species with precocial young—babies that can feed themselves within a day or two of hatching. Mammals are generally promiscuous, but the beaver is monogamous. And some members of a species are monogamous in some situations and polygamous in others.

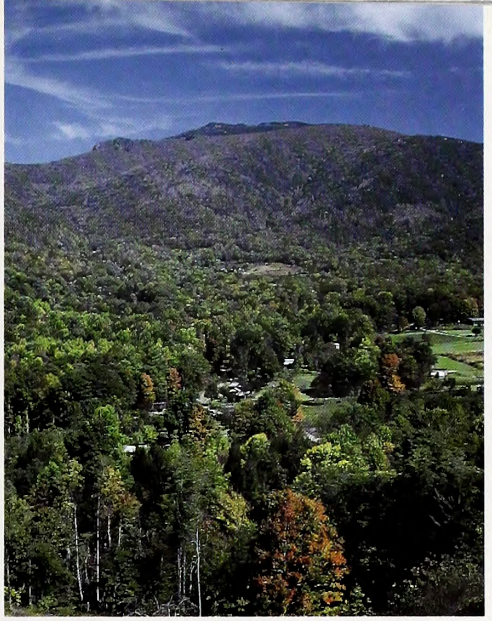
Despite the diversity of mating systems among wildlife species, the result is generally the same: adequate numbers of healthy young.

***Male frogs and toads** mate with as many females as they can find, although females only mate once. This is an example of polygyny. Canada geese, on the other hand, are monogamous and mate for life.*



***Polyandry occurs** when females mate with several males but the male only mates once. The spotted sandpiper is a good example of a polyandrous species in North Carolina.*





# GARDEN IN THE SKY

Long admired for its dazzling display of rhododendron, Roan Mountain is also a magnificent botanical garden of rare plants left over from the last Ice Age.

written and photographed by Harry Ellis © 1992

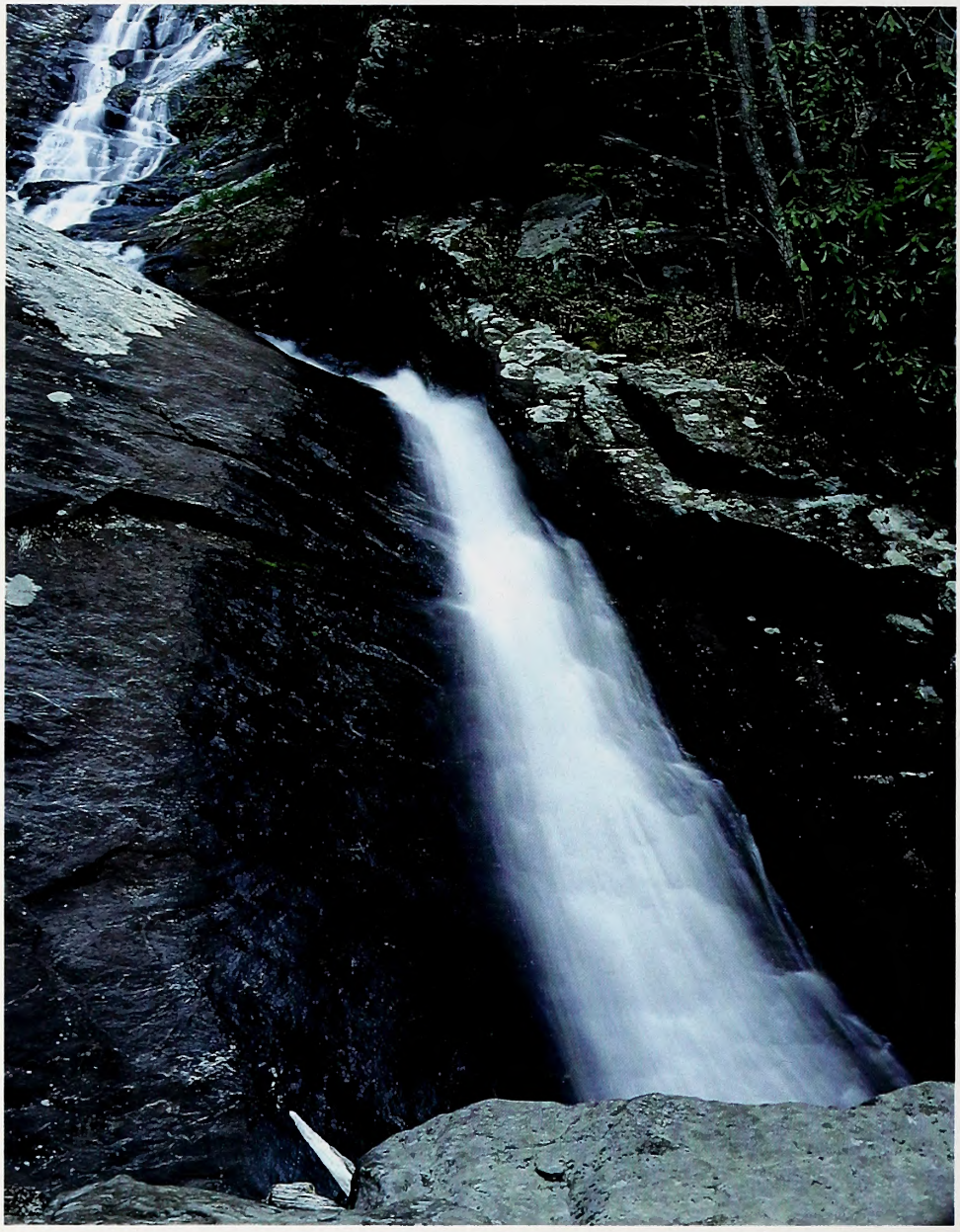
Rising from out of the blue mists on the North Carolina-Tennessee border, Roan Mountain stands 6,285 feet above sea level and almost 4,000 feet higher than the fertile valleys and farms that surround it. In contrast to the abruptly rising, saw-toothed peaks that characterize some of our mountains, it has a gentle, rounded summit of rolling meadows and dark-pinnacled spruce and fir trees, with a string of connecting peaks, saddles and balds that stretch for some 12 miles into the distance.

***For spectacular rhododendron** displays, Roan Mountain is the place to be in June. From Jane's bald, the viewer can see the Appalachian Trail snaking down from Round Bald while in the distance is Roan High Knob. Roan Mountain's rounded summit can be seen from afar (above).*

The top of Roan is known locally as "Cloudland," for here the clouds float and swirl at about the same level as the summit. Sightseers walking in bright sunshine one minute may be engulfed in the heart of a cloud the next. Here in mid or late June, more than 600 acres—probably the world's most beautiful and extensive stand—of Catawba rhododendron (*Rhododendron catawbiense*) blaze with color. The glowing shades of rose, pink and purple are almost breathtaking. To further stun the senses, the blossoms of flame azalea (*Rhododendron calendulaceum*) open and catch fire, adding a mixture of yellows and oranges to the show. To this wonderland, visitors come by the thousands, planning their trips to coincide with the blooming season.

In 1941, the U.S. Forest Service purchased some 20,000 acres of land on and near the crest of Roan Mountain, now part of the Pisgah and the Cherokee National Forests of North Carolina and Tennessee. Later, a two-

# GARDEN IN THE SKY



***Roan Mountain carries** a surprising number of habitats on its slopes and crown—open grass and heath balds, hardwood forests, spruce-fir forests and rocky cliffs. One of the interesting features of the mountain is the picturesque Roan Mountain Falls.*

mile paved highway was built from Carvers Gap to the summit, providing visitors easy access to the natural gardens.

In all the land, perhaps no other mountain is regarded so highly by the people living nearby, who affectionately refer to it as "*the*" *Roan*, almost never as "Roan Mountain." They speak of it with a glowing sense of pride, an almost passionate love, no less, I suppose, than the Scots have for their rolling fields of heather, or the English for their skylarks that soar and sing among the clouds. One woman, gazing toward its summit, told an observer: "The Roan's more than just a mountain." There was clearly a note of reverence in her voice.

Long before Roan Mountain became easily accessible, it was widely known as a scenic wonderland. Shortly before the turn of the century, Gen. J.H. Wilder built a massive, four-story hotel—the Cloudland—on its summit. Guests came in hacks and buggies over roads that were crooked, rough and steep. From the hotel veranda during the day, they were treated to spectacular views of distant mountains, and inside at night, they sat before blazing log fires. One of the guests was Charles Dudley Warner, the famous writer, who came in 1885. In his book, *On Horseback*, published in 1888, describing his stay at Cloudland Hotel, he wrote: "When the wind rose in the night and darkness and the loose boards rattled and the timbers creaked, the sensation was not unlike that of being at sea." Since 1903, when the hotel was abandoned after a 20-year existence, there have been no overnight lodging quarters on the Roan.

Botanists have long regarded Roan Mountain as a treasure chest of rare and interesting plants, some of them found here and nowhere else. Over a span of two centuries it has lured men of science from throughout America and abroad. They include Andre' Michaux, John Fraser, Asa Gray, Charles Sprague Sargent, Moses Ashley Curtis, John Kunkel Small, Elisha Mitchell, and many present-day botanists, some coming from as far away as New Zealand.

Sent by the French government to collect the finest flowers and trees of the New World for the gardens at Versailles, Andre' Michaux was probably the first scientist to explore Roan Mountain. He made a number of trips between 1789 and 1796, where he described and named some of our most characteristic native plants. This we know from his journal, written, perhaps, at night, by the light of his campfires. On these expeditions, he was usually accompanied by his young son, Francois, and a string of horses.

During one of his trips to the mountains, he met John Fraser, the Scot who discovered the fragrant fir tree that bears his name—*Abies fraseri*, the Fraser fir. The two explorers traveled together for a short time, but growing competition and jealousy between them caused Michaux to pretend that he had lost his horses and had to look for them. He urged Fraser to go on alone. Thus, they parted company, and as far as we know, their trails never crossed again. Some believe that it was actually Michaux who gave Roan Mountain its name, after the Rhone Valley in his native France, but this is by no means certain.

**Roan goldenrod** (Solidago roanensis) *covers a mountain bald on Roan Mountain. The origin of these grass and heath balds is unknown. Yet with the end of livestock grazing across this open landscape, many of the balds are growing over in blackberry bushes and other shrubs and trees.*

***The cool, green, wet world** of a spruce-fir forest is found at elevations above 5,000 feet on Roan. The dense evergreen canopy overhead blocks the sunlight, casting the forest floor in deep shadow.*

# GARDEN IN THE SKY

Asa Gray, a Harvard professor and the foremost botanist of his time, climbed Roan Mountain a number of times and declared that it was "without doubt the most beautiful mountain east of the Rockies." Here in 1841, he discovered a scarlet, bell-shaped lily that now bears his name. The Gray's lily (*Lilium grayi*) blooms in Roan's high meadows during late June and July.

On the mountain's lower slopes, below an elevation of 4,000 feet, we find a variety of tree species including oaks, hickories, yellow poplar, red maple, buckeye and locust, with an understory of flowering dogwood and witch hazel. During the spring and summer, delicate wildflowers weave colorful tapestries beneath the trees. There are several species of trilliums, trailing arbutus, bloodroot, Dutchman's-breeches, fire pink and many more. In early spring, May apples unfold their large umbrella-like leaves; and during the late summer, Turk's-cap lilies bloom in open places. Two of the most common ferns here are maidenhair and silvery glade fern.

Between 4,000 and 5,000 feet, sugar maple and beech become the dominant trees. This beech-maple forest community is quite extensive on the higher slopes of Roan. The most common shrubs here are the red-berried elder and the hobblebush (*Viburnum lantanoides*) that has large, flat clusters of white flowers in early spring and bright scarlet berries in late summer. During the month of May, great carpets of fringed phacelia (*Phacelia fimbriata*) cover these high woodland slopes like new-fallen snow.

When the autumn rains come, mushrooms and other kinds of fungi spring up almost everywhere, and many of them are as bright and beautiful as flowers. In addition to the typical gilled-cap type of mushrooms, we see an almost endless variety of others. For example, there are earthstars that look like little brown starfish, coral fungi that resemble bright marine corals, and ghostly looking "bears-heads" that hang from rotting logs.

Above 5,000 feet, the plants more closely resemble that of northern New England and Canada than of a southern mountain. Although the great ice sheets that swept down from the North during the Pleistocene epoch never reached Roan Mountain or any part of our southern Appalachians, they came close enough to bring us a legacy of Northern plants, driven south by the advancing glaciers and the cold. After the Ice Age ended and the land grew warm, many of the plants spread north again, but much of this

***Mycena mushroom*** (Mycena leaiana) *flourishes on a beech log on Roan Mountain. It appears at the limits of its southern range in North Carolina, probably following the Appalachian chain south. This mushroom grows on the dead wood of deciduous trees.*

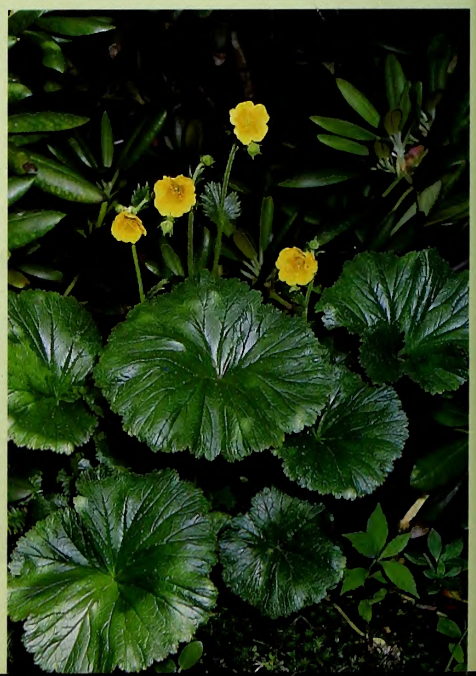
## Garden of Delights

The 20,000 acres that make up Roan Mountain consist of a wide variety of plant communities that range up and down its lofty slopes. The result: an exuberance of lush growth.

Lower down on the mountain's slopes are trilliums, fire pinks, Dutchman's breeches and other plants that paint the forest with color. Higher up is the northern hardwood forest where beeches and maples shelter the lovely fringed phacelia and a lavish assortment of mushrooms. Still higher is the green, wet world of the conifer forests, red spruce and Fraser fir, remnants of the great evergreen forests that spread southward during the Ice Age.

There are rocky cliffs on Roan where the cliff avens—an endangered species—huddles against the icy winds. And there are hundreds of acres of grassy and heath balds, mysterious verdant meadows that are covered seasonally with golden ragwort and three-toothed cinquefoil, bordered by vivid outposts of rhododendron and flame azalea.

Roan's gift to us is its bold and colorful diversity.



***Appalachian or cliff avens,*** *a federally listed endangered species, occurs only in Tennessee and North Carolina, and mostly on exposed cliffs. But on Roan Mountain it also grows among rhododendron bushes on the balds.*

**A plant that appears** *in moist woodlands throughout North Carolina, Indian pipes also develop in the spruce-fir zone on Roan. The white, waxy appearance is caused by a lack of chlorophyll.*

**Gray's lily is listed** *by the state as a threatened species. Pollinated by hummingbirds, the plant blooms in Roan's high meadows in May and June. It is found only in North Carolina, Tennessee and southern Virginia.*

***Turk's cap lily*** *is found in many areas on Roan. It thrives in open areas, but also grows in the deep woods, although not as well.*

# GARDEN IN THE SKY

***Flame azalea blossoms** on the Roan Mountain summit in forests and balds. Along with the rhododendron, the azaleas have given Roan a reputation as a garden of floral delights beyond compare.*

far-northern element of our flora remained isolated and trapped in our high mountain valleys, and especially on the lofty summits, where it still exists today. Time has changed some of these plants into new endemic species (species that grow nowhere else).

The trees of this topmost forest community are chiefly red spruce (*Picea rubens* ) and Fraser fir (*Abies fraseri*), with occasional intrusions of yellow birch (*Betula lutea*) and of mountain ash (*Sorbus americana*), that in autumn bear large clusters of flaming-red berries. The dense evergreen canopy of the Roan forest shuts out much of the sunlight, and to enter it is like walking into a cathedral, with only the singing of birds and the wind in the trees to break the silence. I have heard the wind make many sounds in many places, but if it ever makes real melodious music it is on Roan Mountain.

Wildflowers of the spruce-fir zone include pink turtlehead, Indian pipe, white wood aster and the shamrock-like mountain wood sorrel (*Oxalis montana*), the dominant ground cover. On rocks and sheer cliffs—where humus has accumulated—near Roan High Bluff, grows the rare and beautiful Blue Ridge goldenrod (*Solidago spithamaea*) that has a flat top and is seldom over 12 inches high. Considering its endangered status, this habitat, on difficult-to-reach cliffs, works to its advantage.

The "lower" forms of plant life are also well-represented in this Canadian life zone. The most common ferns are mountain wood-fern (*Dryopteris campyloptera*), fancy wood-fern (*Dryopteris intermedia*), and lady fern. Ground or running pine (*Lycopodium*), one of the ancient fern allies, grows over the ground in attractive displays, especially around the bases of trees, and adds a touch of green to the forest floor during the dark months of winter. Apron mosses of the genus *Anomodon* grow on the trunks of spruce and fir, often circling the entire tree from the roots to 3 or 4 feet above the ground.

In winter, Roan Mountain has a climate more common in Canada, with raging winds, whirling snow, and frequent sub-zero temperatures. Every cliff is hung with icicles and every needle of spruce and fir is rimmed with rime ice, creating handiwork of exquisite design. Spring does not reach these summits until May.

On Roan Mountain, there are hundreds of acres of grass and heath balds that support a rich profusion of plant life. The origin of these lofty meadows, where trees will not grow, is a matter of debate among scientists, and, to date, the riddle remains unsolved. One thing is certain, however: since the first settlers appeared on the scene, grazing by livestock—horses, sheep and cattle—has played an important role in *keeping* them open. Now that grazing has ended on the high summits, trees and shrubs from the bordering forest are beginning to invade the grassy areas and may eventually reclaim them.

Mountain oat grass (*Danthonia compressa*) is one of the dominant plants of the high balds. The wind, never still on these lofty heights, rolls the grass into waves like a billowy sea. When autumn comes, these grasslands change from lush green to wide expanses of burnished bronze. The summer meadows are turned to gold by yellow hawkweed, coneflower and golden ragwort; to white by millions of tiny blossoms of the three-toothed cinquefoil; or to magenta and purple by the tall spikes of fireweed. The purple-fringed orchid also blooms here in mid or late summer.

On some of the high ridges are stands of mountain alder (*Alnus crispa*) so dense that one can barely squeeze through. This Northern species has round, oval leaves, and it usually grows no more than 6 feet high. It is common in the far North, but Roan is its only location south of northern Pennsylvania. Here it is invading some of the grass balds, as is the Canada thornless blackberry (*Rubus canadensis*).

Running along the crest of the Roan Mountain balds—Round Bald, Jane's Bald, and Grassy Ridge Bald—is the Appalachian Trail. This 2,000-mile wilderness footpath begins at Mount Oglethorpe, Ga., and, following along the tops of the highest mountains, ends on the bleak rocky summit of

Mount Katahdin, Maine, not far from the Canadian border.

The windswept balds of Roan Mountain are home to some of our rarest and most critically endangered plants. One such plant is the Appalachian avens (*Geum radiatum*), with bright yellow, buttercup-like flowers and geranium-like basal leaves. Also, the Greenland sandwort (*Minuartia groenlandica*), found on the rocky outcropping of Round Bald, is very rare in our Southern mountains. More than 300 species of flowering plants have been found here, including at least a dozen species of goldenrod.

Almost every year during the course of the summer season, there comes one day that surpasses all others. The air is softer, the hills and meadows greener, and the temperature ideal. It had been just such a day on Roan Mountain, a day in which I had walked through rolling meadows filled with flowers, and over long trails sheltered by spruce and fir. Now the sun was setting and filling the woods with golden light, and before beginning the drive home, I sat down to rest under the evergreens.

For a time there was only silence, not even the rustle of a leaf. Then from the tall spire of a nearby fir tree, a veery, or Wilson's thrush, began turning the silence into poetry. As I listened to its silver notes, I came more fully to realize how utterly precious these things are. For to be truly content, we must be attuned to the influences of nature. We must know sunrises and sunsets, starry nights and full moons, must hear the sound of rushing streams and singing birds, and thrill to the splendor of the changing seasons. Those who live with the beauties and mysteries of the earth are never quite alone, or bored, or weary of life.

As I thought about these things in the fading sunset, I began to understand why so many people have come under the spell and mystique of the mountain. I thought of the words of John Burroughs, the grand old naturalist of Slabsides: "To know is not all; it is only half. To love is the other half." ⊠

***Aside from its rhododendron,*** *Roan is best known for its open grass and heath balds. Hundreds of acres of the grassy balds are covered with mountain oat grass (above), although the grass is gradually being overcome by sedges.*

***Try putting this amount** of gear into a backpack, and you'll quickly see why canoe campers have a luxurious advantage over their foot-bound brethren. Scott Wood (above) prepares breakfast on a beautiful Black River morning.*

# the PADDLING CAMPER

## Tired of lugging that heavy backpack on long hikes? Load your gear into a canoe and let the water do the work.

written and photographed by Eddie Nickens ©1992

It was the best of times, it was the worst of times. The best of times because I was 18 years old, healthy, carefree, four days on the sunny side of high school graduation and two days into a week-long canoe camping trip on the New River. The worst because I had no idea what I was doing.

Jeff Little and I had shoved off into the June waters of the popular mountain stream for what we'd planned to be high Tom Sawyer adventure. While our cronies were jammed on Florida beaches in celebration of their new sheepskins, we planned to be placidly poking our way through rock garden and riffle, fishing a bit, sniping at the occasional ground hog and cooking shore dinners at sundown.

Oh, I'd camped before. Plenty. I'd even paddled a few times—bonus points for that—or enough to figure out it was more fun being in the back ('scuse me, *stern*). That way the other guy doesn't know when you're taking a break.

But I'd never put the disciplines together, and I was soon to learn that a pond cruise or two does not a voyageur make. For our New River madness, we had no one's permission to camp (we'd tent on islands), no map (the river only goes one way), no restraint when it came to packing (a canoe's just like a 16-foot steamer trunk, isn't it?), and the only thing we knew about "gauge" was that it denoted the size of a shotgun's barrel.

So what did we find amidst the splendor of the Blue Ridge foothills? Gin-clear waters, mountains draped in morning mist, the passing of hours and miles without any sign of human activity. But also, a gauntlet of No Trespassing signs, few clues as to the progress we were making, and water so low we spent as much time out of the boat as in it.

I've since learned that it doesn't have to be that way. Canoe camping is just as easy as camping from your car and infinitely easier than camping from your back—but it takes more planning than the former, and almost as much plotting as the latter.

In North Carolina, the camping paddler can plant a blade in salt waters while en route to a remote barrier island or can plow a watery furrow through whitewater streams clear and cold enough for trout. On state parks and other public lands there are canoe trails that meander along lakes, down rivers and past rocky outcrops just a few miles from the city limits of the Piedmont's metropolitan areas.

But before you shove off for a similarly enthusiasm-rich, but information-depleted adventure, ask yourself a few questions. Do you know how to trim a canoe without using paints and draperies? Do you know the J stroke? Can you read a river gauge? Do you own or have access to six gallons of bug dope? If the answer to any of these questions is "no," despair not. There is hope. But a crash course in canoe camping is in order before you take to the river.

First, let's talk about the canoeing portion of canoe camping. I'll assume you already own your craft, or plan to rent one for an upcoming trip. It's not practical here to delve into a buyer's guide to touring canoes. Instead, spend an hour in the library and an afternoon at your

***While you can carry** plenty of camping gear in a canoe, you can't just pack it anywhere. Loading the equipment so that the hull is in trim—with the weight evenly distributed—will make paddling far more efficient. The trim can also be adjusted to match wind or water conditions.*

friendly neighborhood sporting goods dealer.

Although the Canadian voyageurs of yore spent months living out of their boats, chances are your itinerary will more closely resemble that of a weekend warrior. Two nights on the water, maybe three, and it's back to *terra firma*. In canoeing terms, that means you can haul infinitely more luxury items in a 16-foot hull than in a 2,000-cubic-inch backpack, or in the trunk of most sardine cans that pass for cars these days. Matter can be neither created nor destroyed, according to one little known Law of Canoe Physics, but space for one more toy can always be found in the boat.

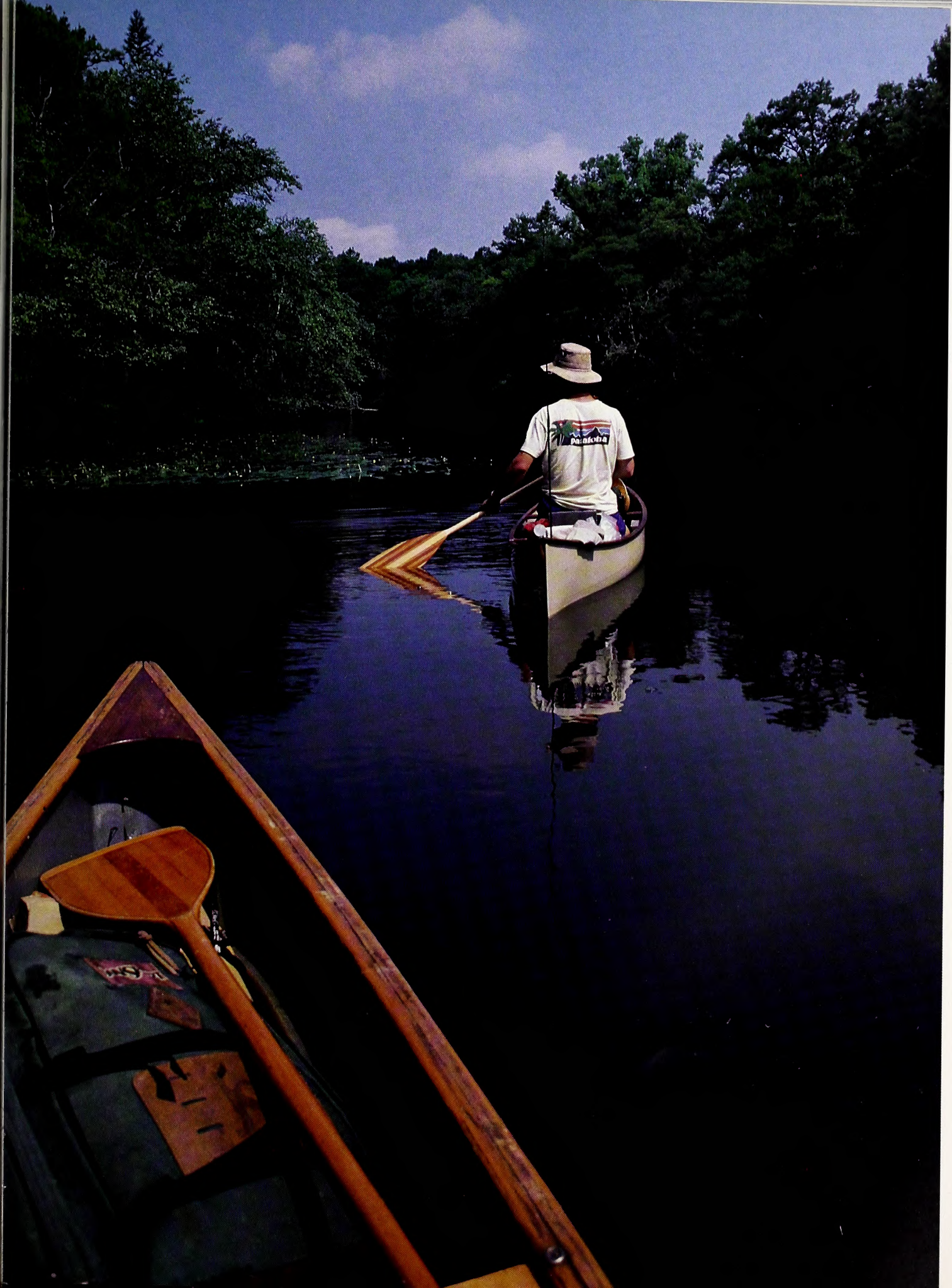
Such freedom, alas, demands responsibility. In their 35-foot birchbark canoes, the fur trappers packed 90-pound parfleches stuffed with pemmican, along with a small cask of rum from which the bourgeois, the leader of the canoe brigade, would dole out drams to his paddlers.

I'd hold off on the hard liquor, but the fact remains that a canoe will carry the stuff of comfort if not downright convenience. My boat has a payload of 1,100 pounds, including paddlers. That luxury means I can—and have—floated all necessary gear plus a bushel of oysters to the Merchants Millpond canoe campground. It means I can carry more fishing gear than I could possibly use on the Black River. And it means I can load my boat with camp chairs, gas lanterns, coolers of venison sausage and canned drinks, and still bob well above the waterline. But you must load smartly in order to carry efficiently, and this is where many first-timers start yawing toward canoeing chaos. The key to loading a boat correctly is to keep the hull "in trim." For normal paddling conditions, that means the combined weight of paddlers and their gear is evenly distributed between the bow and stern, and the canoe sits level in the water.

Sounds like a minor little detail, right? That's what I thought, too, last year on a Black River overnighter and my first venture out with an accomplished canoe camper. Scott Wood asked me to check his trim just after we put in on a tributary of the Black, and I was somewhat shaken. We were headed for three days in a cypress swamp. Why should he care what his hair looks like, I wondered.

He clued me in. A bow-heavy boat has trouble staying in track, and turns downwind if the breezes shift to crosswind. Slicing into a headwind in a stern-heavy hull will also throw you off course and your paddling joints out of whack. The secret is to leave at home the Jumbo Duffel and load your gear into smaller drybags and daypacks. That way you can shift weight in the canoe to match the paddling conditions: level in calm winds, a bit heavy in the bow for headwinds, and slightly stern-heavy for crosswinds and tailwinds.

Details such as these make an enormous difference on a trip of any duration. Consider the paddle. To most folks, a canoe paddle is a beaver tail-shaped wedge of wood or aluminum attached to a handle and grip of like material, end of story. But tell that to the paddler who has dipped a $9.99 metal monstrosity into the Cape Fear River 50,000 times during the past three days. He'll know how stupid he was to turn up his nose at that more expensive feather-light, wood-strip paddle with a T-bar grip and a 7 percent bend to the power face. If such a high-tech oar saves you



## Guides Worth Having

The indispensable resource for any North Carolina paddler, whether you intend to camp or not, is a copy of *Carolina Whitewater* and *A Paddler's Guide to Eastern North Carolina*. The two guidebooks give maps, difficulty ratings, access points and gauge locations. And between the two they cover the great majority of the state's floatable waters.

As its title suggests, *Carolina Whitewater*, by Bob Benner, is a section-by-section profile of whitewater streams, from the Piedmont west. For the canoe camper, it's as valuable in telling you where not to go as it is in pointing you toward a possible destination. Class 2 waters aren't beyond the reach of canoeists with some float time under their belts. Benner's book will tell you when to hit the shore instead and heave your craft overhead.

Much of the state's best canoe camping is to be found on the gentle streams of the Piedmont and the blackwater streams of the eastern portion of the state. *A Paddler's Guide to Eastern North Carolina*, by Benner and Tom McCloud, covers the rivers and feeder streams of the seven major river basins found in the Piedmont and Coastal Plain. Some of these rivers are wide enough to float a barge, others are tiny blackwater streams that wend through bottomland forest or brackish marsh. In addition to profiles and stream particulars, *A Paddler's Guide* details other concerns of interest to canoe campers, such as the paddler's legal rights and an overview of paddling ethics.

Perhaps the best reason to consult these books before paddling a particular stream are the gauge guides enclosed in both volumes. Benner gives directions to stream gauges and suggests minimum gauge readings for both solo and tandem boats (remember you'll be carrying much more weight than a boat with paddler only). If the water you're considering is below Benner's minimums, chances are you'll hang up on rocks and trees and sandbars and find the going slow, if you can go at all.

Both books, published by Menasha Ridge Press of Birmingham, Alabama, are available in bookstores.

only a barely detectable amount of energy each time you plant it into the stream, it will save you whole aspirin bottles' worth of grief by trip's end. Listen to the experts. Invest in a serious and suitable power conveyance.

If you've dropped an appreciable percentage of your gross personal income on a paddle, at least you're more likely to learn how to use it correctly. Your paddling pleasure will be greatly increased if you learn a few other paddling maneuvers besides the basic dip 'n' pull stroke.

For starters there is the J stroke, which any Boy Scout can perform, and which Wood unaffectionately calls the "goon stroke." The paddler plants the blade in front, pulls the paddle behind, then carves a "J" into the water. That movement at the end of the stroke corrects the yawing of the bow that occurs each time power is applied at the stern. It works, but to paddling aesthetes like Wood, it doesn't work well enough. There is, he told me, a better way.

One afternoon, after a few miles of bemused observation as I flailed helplessly to keep up, he pulled alongside to demonstrate. Planting the paddle forward, he angles the blade under the hull of the boat and he pulls, keeping the knuckles of his grip hand in a plane above the boat's gunwales. As the paddle moves behind, he turns the blade perpendicular to the water, and pries the stern into the direction of the bow. The boat plows ahead in a straight line. This stroke—angled, technical, designed for efficiency, not power—saves despair and agony over the long haul. Wood promised me the alien movement would become second-nature, which it did. Sort of. When I tired of paying attention to what I was doing I'd check to make sure I was alone, and revert back to a few rounds of the good old goon stroke, just for a break. To let me muscles rest, you understand.

Paddle far enough into the heart of North Carolina's remaining wildness and you'll no doubt run into what must be a trademark of canoeing the backcountry of the Old North State: logjams and beaver dams. One nifty trick is to know how to drag your boat over such impediments without having to take the long way around. It's possible to perform this maneuver solo, but easier if you're floating tandem. First, pull alongside the blockage, and step gingerly from your boat onto the log or dam. Then push the craft back into the stream, and pull the bow or stern of the canoe perpendicularly into the impediment. Then lift and pull the boat over and between you and your partner. Climb in and go.

Canoe campers will also learn that mosquitoes like to hang around the best places to float a boat, and a canoe seems keenly suited as a sort of floating bug buffet. You can't swat skeeters with both your hands on a paddle,

***Although the Black River** (right) has no rapids, a quality paddle and proper paddling techniques make canoe handling infinitely easier on any type of water—and much more fun—especially when your excursion stretches into several days and thousands of paddle strokes.*

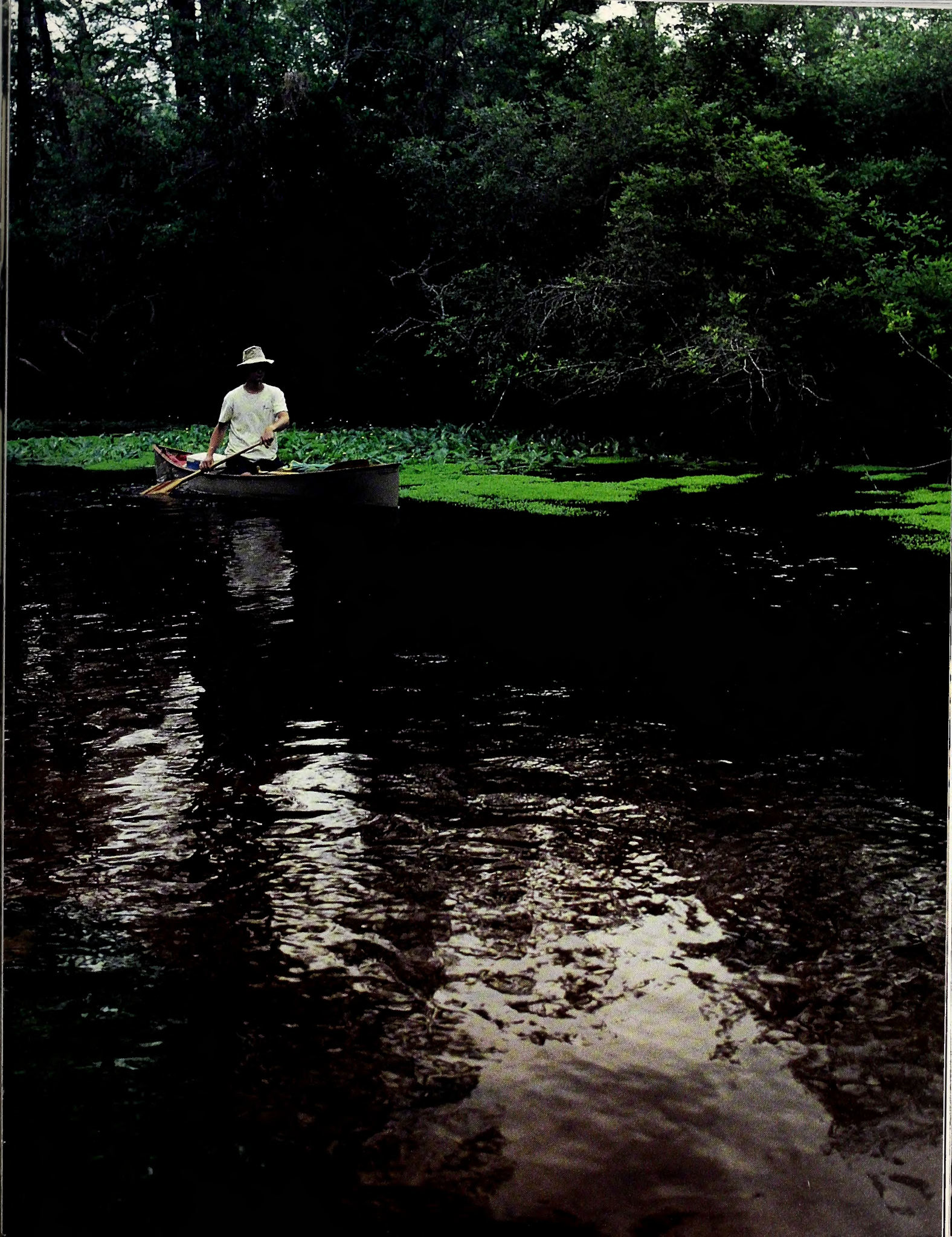
and the flying hellions take refuge out of the wind under seats and splash guards where they plot assaults on uncovered ankles and the backs of thighs. The only effective repellent is repellent and plenty of it. I keep a bottle handy to dose ankles, feet and legs that take a constant soaking during the trip.

Floating down the Lumber River one morning, my wife and I encountered what seemed to be pods of biting flies. We'd go for an hour without seeing a single bug, then drift into a curtain of greenheads. I soaked the brim of my hat in Muskol to form a vapor shield of DEET. It worked well, though the long-term effects on corneas and brain stems aren't yet in.

Heavy-laden as you now are with insider tips and information, it's time for you to practice what I preach. Several state parks offer canoe access and canoe camping. Among them: Merchants Millpond State Park, Eno River State Park, New River State Park and Raven Rock State Park. Almost any stream capable of floating a boat has hosted canoe campers, but secure permission from landowners before you pitch a tent on private land.

And once you're on the water, slow down. For a float trip down the Black River, a two-nighter we took last spring, I figured each stroke carried me and my craft five feet further downriver, to the tune of 1,056 strokes per mile, or 25,344 strokes for the 24-mile distance we covered from put-in to take-out. And that figure assumes I paddled a straight line down the middle of the serpentine river. Anyone familiar with my flat-water paddling skills knows this is far from the truth. I carved my own route along the flat face of the stream, meandering from bank to bank and back again in a course much like the river's flow across southeastern North Carolina. A bird's whistle or squirrel's bark halted my stroke in mid-draw, and I'd drift toward the sound. A ridge of resurrection fern snaking up a tree trunk drew my eye and then my boat; a likely looking eddy had me fishing for my fly rod; the sights and sounds of the wilderness swamp gave me countless excuses to halt my paddling, to drift along quietly under a canopy of green.

There are few finer ways to spend summer days. Too bad it took me 10 years to learn how to do it right. ⊠



# RIVER BASS

Here's a bait-fishing tactic that will help you unravel the mysteries of catching fish in blackwater rivers.

written by Bill Lamb ©1992
illustrated by Jim Brown©1992

I gently sculled my flat-bottom boat through the tanin-stained waters of Tranters Creek and picked my next spot to cast. Using a side-armed cast, I threw my unweighted night crawler and bright red Styrofoam cork almost parallel to the water. The bait and float skipped once, then settled into the dark waters 4 feet under the bushes. The cork lay on its side for a second as the night crawler wriggled enticingly toward the bottom. Suddenly the cork stood at attention and stayed there. I set the hook and a 4-pound largemouth soared for the sky, gills flaring in the springtime sun. After a few minutes of battling the bass in a tangle of lily pads and cypress roots, I added it to a stringer that included catfish, brim, warmouth, pumpkinseed and crappie. Another typical day fishing with night crawlers in eastern North Carolina.

I've found no bait or method is more effective for constant springtime action and for catching a variety of fish than night crawlers fished below a small Styrofoam cork with no weight. I first developed this method in response to several years of mediocre fishing after moving to eastern North Carolina from my home in Georgia. There, I had fished mostly in reservoirs where you have a gently sloping bank. Most of the cover comes in the form of old standing brush and timber located 10 or 20 feet from the bank.

Upon moving to eastern North Carolina, I continued to fish the perimeter of the brush piles and lily pads with little success. After many months of studying the problem, I realized that although the main river channel is lined with overhanging bushes, the water extends 5 or 6 feet beneath the initial bushes. After much experimentation, I found that by using a small Styrofoam cork and half of a night crawler, and by casting side-armed, I could actually skip my bait under the overhanging bushes into the dark, protected waters that few anglers ever fish. My catch tripled using this method.

Not only was I amazed by the number of fish I caught, but by the variety. In addition to the expected brim, pumpkinseed and yellow perch, I caught a lot of crappie, bass, catfish and even an occasional pickerel. In fact, I caught so many bass in the spring that I refined my technique so that I was fishing primarily for bass even though I still caught many of the other species. The only change I had to make was to use a whole night crawler instead of half. The intact crawler is harder to skip under the overhanging brush but it is possible to do with a gentle casting motion.

This method is extremely effective anytime fish are in shallow water, particularly in places where they are holding tight against the bank. Unlike a plug or a spinner, the night crawler and bobber land softly and stay in the fish zone. You rarely spook fish with this method. Also, the night crawler sinks slowly just as a real worm would when it falls into the water.

This method is also a deadly tactic for the bank angler. I use it exclusively when fishing in the canals around Washington and in farm ponds. For bank fishing, I alter my method slightly. In addition to casting parallel to shore, I walk softly along the bank and gently flip or lower my crawler into spots that no boat angler ever reaches. Prime areas are small spaces between logs or brush and the bank, in the middle of brush piles, in-between lily pads and the shore, and even between a boat and the dock. The last place is particularly deadly for crappie.

I caught my largest bass, a 7-pounder on half of a night crawler in a farm pond. I had just lowered my crawler in a small space between a brush pile and the bank when it hit. Trying to wrestle that lunker out of a 1-foot space was all the excitement I could handle. An average day's fishing in the canals running off the Pamlico River in Washington might include 10 bass and assorted panfish.

I use a medium-action spinning rod, which is a compromise. You want the rod to be light enough so that you enjoy the fight of panfish, yet heavy enough so you'll have some chance of wrestling a big bass out of heavy cover. I finally settled on 8- or 10-pound test line. Any heavier and it's too hard to throw the light bobber with no weight. Any lighter and you lose too many bass. Also, I think that a slightly heavier line makes the crawler sink slower, giving the fish more opportunity to see the bait as it falls. A 2-inch cylindrical Styrofoam or cork bobber is perfect. They skip easily, land lightly and are easy for even a small fish to pull under.

Hook choice is important. When I first started, I used the standard thin-wire hook that most bait fishermen use. The advantage to this hook is that it keeps the bait a little livelier, and if you hang up, the hook will bend before your line snaps. On the other hand, a big bass hooked in heavy cover will bend the hook everytime. I finally settled on a No. 2 Tru-Turn hook. These hooks are strong but still fairly thin so the bait stays fresh. The No. 2 is slightly larger than the one commonly used for panfish, but I'd rather lose a small

panfish because the hook is too large than lose a large bass because the hook is too small.

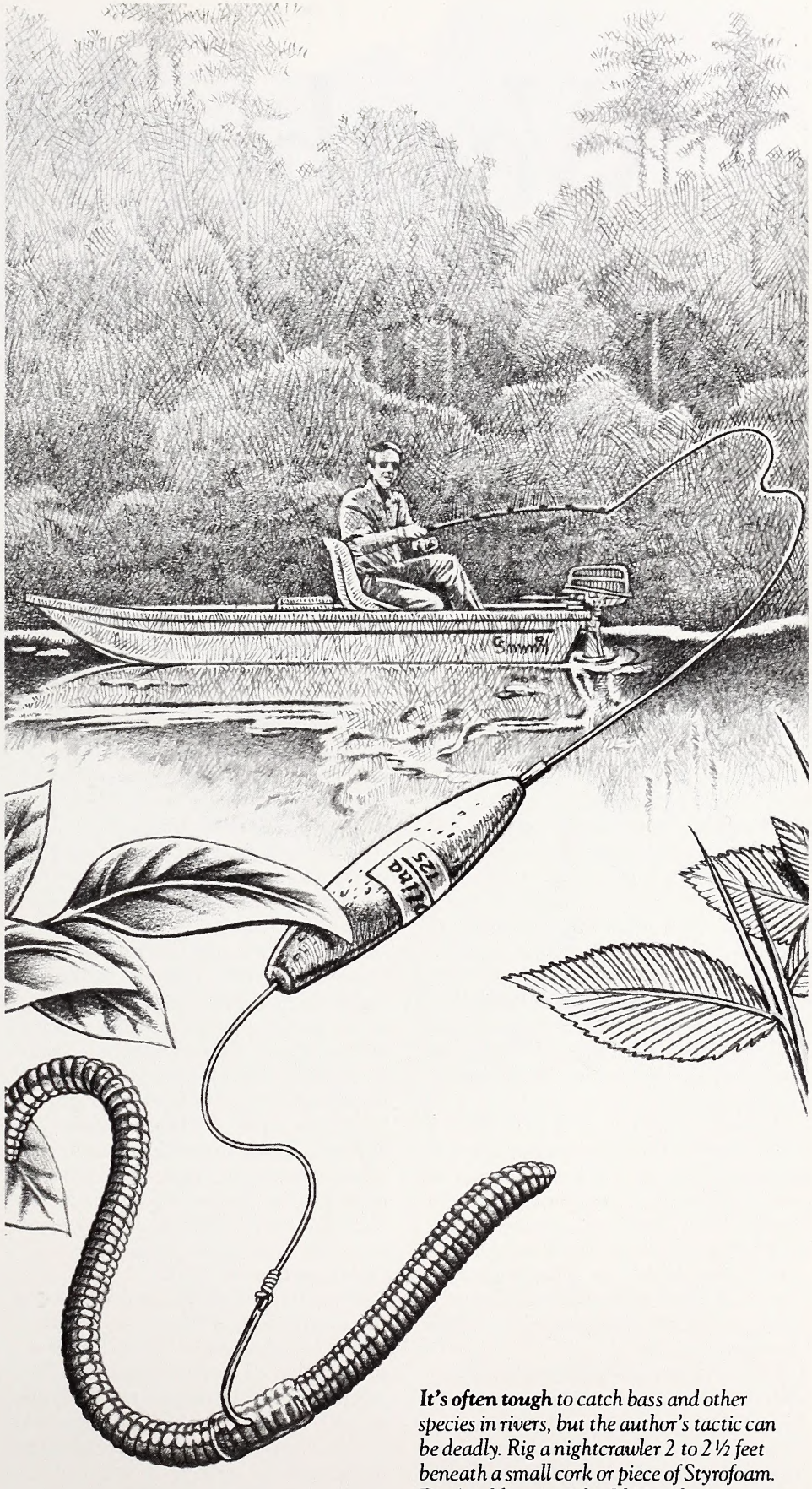
In eastern North Carolina, this method can be effective as early as February, particularly if there is a period of several warm days in a row. I remember one warm February day when I had been fishing deep water with minnows for yellow perch for several hours with no success. Since I wasn't catching fish, I thought I might as well fish using a method that was fun. I got out my trusty night crawlers and headed for the shoreline. On my first cast into the shallow water, I picked up a 12-inch yellow perch. I wound up catching 25 large yellow perch and a bunch of bream on a day when other fishermen were having no success in deeper water. Farm ponds are also a good bet after several warm days. They warm much faster than rivers or lakes. Even in January, a few warm days can bring the bass into the shallows to feed.

Fishing really picks up in late March, however, as the fish move into the shallows to spawn. This method can be good even in the middle of the summer. In the summer, concentrate your efforts on shaded areas under overhanging brush, lily pads and boat docks. Look for boat docks where all of the logs and debris have not been cleared out. Some boat docks are better than others. There is one boat dock I've found where a log lies about 2 feet from the base of the dock. By gently dropping my night crawler in the space between the log and the dock, I pick up a bass almost every time I fish this spot.

One of the keys to this method is to fish your cork and crawler as you would a lure. Keep your boat moving or keep walking the bank. Throw out the worm and let it sit for a few seconds, then reel in and throw to another likely-looking spot. Because the worm and cork land so lightly, they don't spook fish much. The fish will usually hit the night crawler as it is falling. Because the fish usually hit the worm as it sinks, it's important to rig the cork between 2 and 2½ feet deep. This gives the fish plenty of time to see the offering.

Because you will be using a whole night crawler and a slightly larger hook than usual when panfishing, it is important to be able to distinguish between the bites of a bass and a panfish. The bass's bite will usually be slow and steady. Many times the bass will merely stand the cork on its end. On a slow steady bite, set the hook immediately. This way you avoid hooking the bass deeply in case you want to release it. A panfish's bite will be erratic. Let the fish have it until the cork moves away steadily.

If you use this method I guarantee you will catch loads of springtime bass and have nonstop action on a huge variety of fish. Just remember to leave those split shot at home. ⊠



***It's often tough** to catch bass and other species in rivers, but the author's tactic can be deadly. Rig a nightcrawler 2 to 2½ feet beneath a small cork or piece of Styrofoam. Don't add any weight. Use a side-arm cast so you can reach under the overhanging brush along the bank. Bass and other species can't resist that slow-sinking natural bait.*

# Weather Watch

Experienced salt-water fishermen know weather often determines whether you'll catch fish or not. But do you know why?

written and photographed by Joel Arrington ©1992

By December, Outer Banks surf temperatures have dropped to the margin of a speckled trout's comfort range. Al Syvarth, one of North Carolina's top trout anglers, knows he would be wasting his time to fish where the water remains below 50 degrees. Yet he knows that if the surf's temperature should rise only a few degrees, he stands a good chance of success.

At his home on Roanoke Island, Syvarth stays warm and makes his Christmas preparations while he monitors the TV weather channel, noting how fronts sweep across North America to the eastern margin where he lives. If air temperatures rise unseasonably and winds are forecast to be light northeasterly, he grabs his rod and a box of lures and hurries to fish surf sloughs at low tide north of Oregon Inlet. If winds are expected to blow from the southeast, he may drive to Cape Point and fish sloughs near Hatteras Light. If the wind direction is expected to be from the southwest, he might fish from Cape Point south to Hatteras Inlet. Syvarth waits, in other words, for onshore wind.

Weather is mostly the result of interactions between moving high pressure and low pressure systems. Wind direction at any given point on the coast is determined by the location of the pressure system controlling the weather at the time. Winds circulate clockwise around a center of high pressure, counter-clockwise around a low, so anyone can determine wind direction by the location of a system's center.

As Syvarth and most other anglers know, wind velocity and precise direction can directly affect salt-water fishing. A basic principle is that onshore winds warm ocean water near the beach, while offshore winds cool them. Wind from off the land pushes the warmer surface water away from shore, causing deeper water to well up and take its place. Water from the depths is colder than that at the surface, so offshore winds drop the water temperature next to the beach.

Conversely, onshore winds shove warm surface water to the land's edge, warming the surf. But Syvarth points to an added benefit. "It causes the bait to accumulate on the beach side of the sloughs," he said. "I don't have to cast as far."

Another basic principle: Weather patterns that are likely to improve fishing are those that adjust conditions toward the mean rather than away from it. For example, in late summer when the water is hot, count on cooling conditions; in spring, a few days of balmy weather might improve fishing.

To understand the effect of weather on fishing in North Carolina coastal waters, it's helpful to look first at the big picture. A satellite camera locates North Carolina at temperate latitudes on the edge of the North American continent. The Atlantic Ocean moderates temperatures along the continental edge, keeping the thermometer within the comfort range of fish and anglers at times when everything could be simmering or frozen solid inland. At these latitudes, the weather is subject to marked seasonal variation, unlike locations nearer the equator where weather remains less variable. Masses of cold, dry air slide down from polar regions to contest warm, moist, tropical air masses pushing up from the south.

Most of coastal North Carolina's weather comes in the form of fronts moving down from the north and west, and up from the south and west. Occasionally a storm will approach from the south as a tropical depression or hurricane or one will form over North Carolina's coastal waters, stimulated by the Gulf Stream.

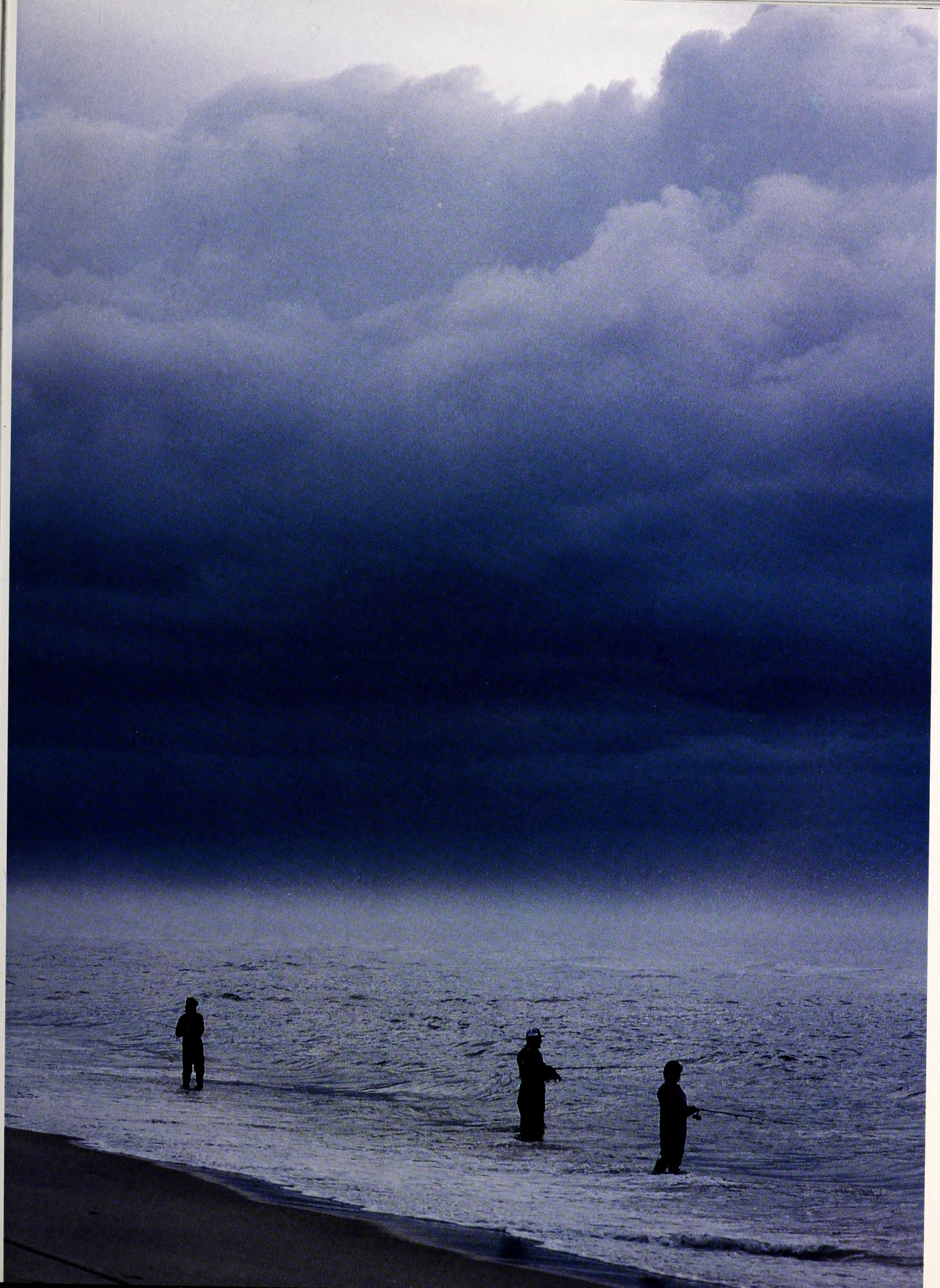
Wallace H. Demaurice, officer in charge at the U.S. Weather Service office at Cape Hatteras, said that the temperature differential between the ocean and the warmer Gulf Stream running up through it is the triggering mechanism for one of the most prominent phenomena of North American weather—the Hatteras Low. "It's an explosively developing low born of a dying cold front that has stalled across the southeastern U.S.," he said. "Small waves of low pressure roll along the leading edge, causing only showers until the front moves over the Gulf Stream. That added heat gives it just enough kick to cause the low pressure to deepen. Atmospheric pressure here can and often does fall to the level of severe storms."

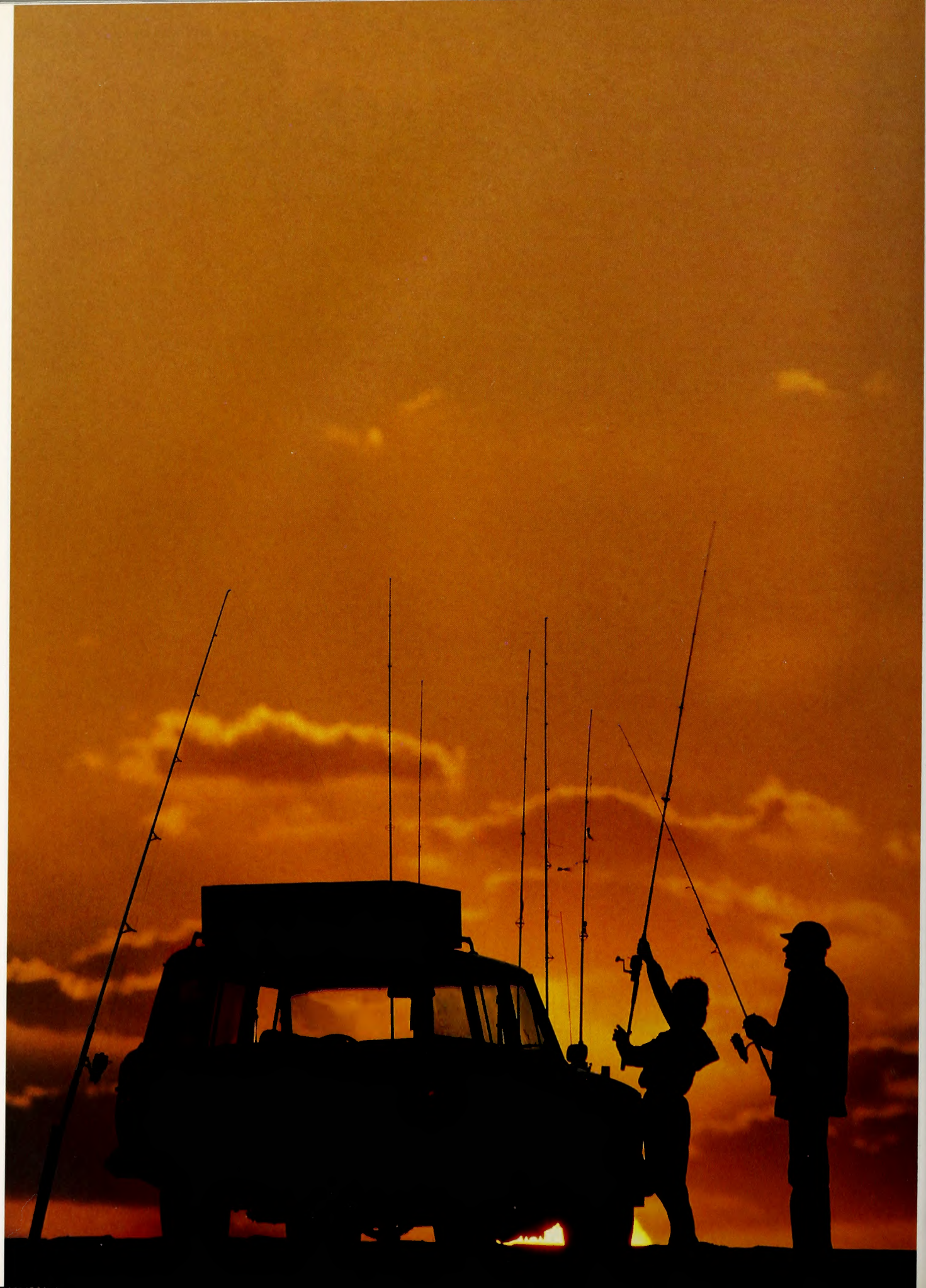
Of course, storms affect fishing adversely, for the most part. To see how weather helps fishing, we've got to look again at the big picture.

Northeast wind prevails in coastal North Carolina for about three months in winter, southwest wind for the rest of the year. In spring and fall, wind regimens go through a drawn-out process of reversal. Breezes come from the north for awhile, then from the south, depending on weather systems passing through, then settle out to a more consistent direction. These changes in wind direction as fronts pass through—up to three a week in winter—can make huge differences in fishing success.

Consider late-summer offshore fishing out of Oregon Inlet. By early September, a series of cold fronts has typically begun to blow through the region. Usually brisk north-

***These persistent anglers** continue to try their luck in spite of threatening weather, though they should be wary of lightning. Most likely, it's because they know that changing weather often creates good fishing. Fishermen who take time to study the weather's effects on fishing will almost surely enjoy more consistent success.*





***Surf fishermen** always greet the dawn with anticipation, but have they checked the weather forecast, and do they know how to adapt their strategies to the day's forecast? Successful fishermen know that weather isn't just something that happens above water.*

easterly winds accompany the fronts, so that fishing is difficult or impossible. Those very winds that might prevent fishing, however, set up currents that tend to concentrate bait schools. Offshore pelagic species like blue and white marlin and sailfish, along with tuna, wahoo and other species, already in migration from northern latitudes, congregate en route to feed on this bait. Fish also find the cooler water temperatures north of Oregon Inlet in late summer more comfortable than the Gulf Stream. Anglers who get out after a front's passage on the first day that winds permit will find the greatest concentrations of bait and, most likely, fish feeding on them. Each day of calm weather thereafter permits dispersal of bait and gamefish—eroding fishing success—until the next front blows through.

That's a late summer transitional weather pattern. Demaurice described the typical winter and summer weather patterns for North Carolina. In winter, an arctic dome of high pressure follows a cold front out of Canada and centers in the Ohio Valley, where it may hold sway for several days. With clockwise flow around the high, winds on the coast are northeasterly. The summer counterpart is the Bermuda High, whose pressure may be more variable, but which, when strong, blocks penetration of cold fronts through he warm months. The high may weaken, however, especially in June, and allow fronts through. The center of the high lies east of Cape Hatteras, often near Bermuda, and the flow is from the southwest, bringing up moist air from the Gulf of Mexico.

These seasonal wind patterns have been sufficiently dependable for enough thousands of years that fish have evolved to use them in their life cycles. Most of our commercially harvested finfish, for example, spawn on the edge of the Gulf Stream and count on currents, determined by wind in play with the tides, to move their eggs and larvae into the estuaries. Failure of wind patterns, scientists tell us, can mean spawning failure. When that happens, as it occasionally does during a mild winter, the impact is substantial. Such reduced spawning success might in part explain long-term population cycles of certain species, like croaker and spot.

Wind patterns may have given North Carolina and Virginia the biggest red drum in the country, too. The theory, as described by Dr. William Hassler, retired fisheries maven at N.C. State University, goes like this: The cool, nutritious discharge plum of Chesapeake Bay, together with rich upwelling that results from predominantly southwesterly winds, create a more nutritious habitat close to shore north of Cape Hatteras than occurs anywhere south of it. Here red drum evolved to grow to ages and sizes unmatched by red drum elsewhere in their range—now south to Florida and across the Gulf states to Mexico. Some of the largest Tar Heel red drum have been aged at over 50 years. Fish species, Hassler said, tend to have longer life spans at colder latitudes than in tropical waters. So a local population in a cooler, more nutritious environment perhaps evolved to live longer and grow bigger than others of its species in warmer, less nutritious portions of the species' range. That environment remains more nutritious at least partly because the wind blows predominately offshore north of Cape Hatteras for about nine months of the year.

Weather has these long-term effects and it can also change fishing in the short term—even immediatly. Angling in Pamlico Sound near Hatteras Inlet for speckled trout in October, you want water temperatures between 55 and 65 degrees. No sudden changes, please. You can be doing well when a front comes racing though with strong northwest wind. That's offshore everywhere along the Outer Banks and remains a wind direction with few redeeming qualities for the late-fall angler. The air itself is cold, and the wind will pull cold water up next to the beach. Then one tidal change will bring that water into Pamlico Sound where it will stop trout fishing cold.

Conversely, a wind switch to the southwest will just as quickly improve fishing there. Trout fans who stay tuned to weather forecasts and who drop everything and race to Hatteras Inlet—or to any of their favorite fishing spots—just as conditions get "right" are likely to succeed famously.

A regular visitor to Hatteras Inlet, Al Syvarth enjoys a reputation as an expert trout fisherman because he learned long ago that the more he knew about weather, the better angler he'd be. ☒

## Offshore Weather Guide

| OUTER BANKS | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Percent precipitation* | 7 | 7 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 5 | 3 | 2 |
| *Average air temperature* | 51 | 50 | 53 | 60 | 68 | 75 | 79 | 80 | 76 | 69 | 61 | 55 |
| *Average water temperature* | 59 | 55 | 56 | 60 | 68 | 75 | 79 | 80 | 78 | 73 | 68 | 63 |
| *Percent waves equal to or more than 8 feet* | 25 | 26 | 21 | 16 | 11 | 9 | 6 | 7 | 12 | 21 | 20 | 22 |
| *Average wind speed* | 18 | 17 | 16 | 15 | 14 | 12 | 12 | 12 | 13 | 16 | 16 | 17 |
| *Prevalent wind direction* | N | N | N | SW | SW | S | SW | SW | NE | NE | N | N |

| SOUTH COAST | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Percent precipitation* | 6 | 8 | 7 | 5 | 5 | 5 | 4 | 5 | 5 | 6 | 7 | 6 |
| *Average air temperature* | 53 | 53 | 56 | 64 | 70 | 77 | 80 | 81 | 77 | 70 | 63 | 57 |
| *Average water temperature* | 63 | 62 | 60 | 64 | 69 | 77 | 81 | 82 | 80 | 76 | 70 | 67 |
| *Percent waves equal to or more than 8 feet* | 19 | 24 | 12 | 7 | 5 | 8 | 6 | 3 | 13 | 21 | 13 | 22 |
| *Average wind speed* | 17 | 19 | 17 | 14 | 13 | 13 | 12 | 12 | 14 | 17 | 16 | 17 |
| *Prevalent wind direction* | N | N | SW | SW | SW | SW | SW | SW | NE | NE | N | N |

# The Circus Lizard

## The Carolina anole isn't a true chameleon, so why does it change color? Chances are it's irked, cold or simply in love.

written by David S. Lee ©1992
photographed by Jack Dermid ©1992

Several years back, when the circus made its annual visit to Raleigh, I went. It was enjoyable enough, but something was missing. Yes, now I was an adult, and I hadn't been to a circus since childhood. But that wasn't it. A circus in Dorton Arena was not the same as one in a big tent, and whatever the reason, the entire event was not dominated by the odor of elephants as I remembered from the past. There were still clowns, cotton candy, long lines and bears riding tricycles. Probably the same bears; certainly they were the same tricycles.

It took most of the show for me to realize that what I was unsuccessfully searching for was lizard jewelry. Remember when they used to sell them at the circus? Curios of living lizards with flimsy collars, short brass chains and safety pins to secure them to your shirt. Popularly marketed as chameleons, these were really small climbing iguanid lizards common in the southeastern United States.

True chameleons are a specialized Old World species with permanently curled prehensile tails, long sticky insect-zapping tongues, and weird telescopic eyes that move in different directions simultaneously. With mitten-like feet, real chameleons clasp tropical foliage and, except for their unexpected, lightning-like tongue flicks, proceed through life at a pace that would bore a sleeping sloth.

The more lively species from North America, while sometimes labeled American chameleons, are best referred to as anoles. The shared name "chameleon" comes, not from a common ancestry, but from the ability of both types of lizards to change color.

Although a variety of animals perform gradual color or pattern changes with age, only a small number seem to be able to change colors and then switch back again. Marine fishes, ranging from well-known species such as flounders to obscure ones like frogfish, can shift colors rapidly as can most species of octopuses and squids. Additionally many fish take on distinctive spawning colorations that may persist for days or weeks. Among the land animals, however, only a few types of frogs, the true chameleon, anoles and several lesser-known lizards have perfected the art of rapid alterations in coloration.

A logical, but incorrect, assumption is that anoles change their color to match their background and therefore achieve protection through camouflage. Anyone keeping pet anoles will eventually discover this is not the case. I hate to think of how many Ringling Brothers' anoles I forced to sit on objects of different colors waiting for my first orange, striped or polka-dotted lizard. Why did they not live up to their renowned color-matching abilities?

At any given time, two lizards in the same cage are most likely to be the same color even if one is resting on a brown log and the other is in a green clump of ferns. A scorecard used to tally coloration under different conditions will reveal that the changes are an indication of emotional states and environmental factors having nothing to do with the color or colors

***Often called chameleons*** *or lizards, these commonly seen reptiles are actually anoles. Contrary to popular belief, anoles do not change colors as a means of camouflage. Instead, emotional factors such as dominance and submission, and environmental factors such as temperature and light, affect their coloration.*

# The Circus Lizard

***The coloration of anoles*** *ranges from dark brown to various shades of green. A change in color can signify moods to other anoles. Likewise, changes in color can help the anoles regulate body temperature. In cool temperatures with bright sunlight, for instance, anoles are often dark brown, as this color readily absorbs heat from the sun.*

they may be resting on.

Anoles, particularly males, are quarrelsome and will take on predictable shades when they win, other colors when they lose. Thus, the green winner is easily distinguished from the brown loser. Color changes are more often the result of changes in temperature and light. If the lizard is cool and the day is cloudy, the lizard assumes its brown coloration. When the temperature increases but the day remains overcast, the anole turns green. In bright light, it remains brown. If air temperatures rise above 100 F, however, anoles become a pale grayish green and stay that color no matter how the light conditions change. In the dark, at less extreme temperatures, anoles are pale green.

It takes several minutes (usually three to 10; the time decreases with increased temperatures) for anoles to convert to new colors, and for those curious about such things, the color shifts are easy to watch. Flipping on a light, for example, does not instantly change the lizard's color. With captive animals, one can hold a piece of paper next to the side of a green anole, covering a portion of the skin. Turn on a strong light and the lizard will slowly transform to brown. But when the paper strip is removed, the pigmentation on the skin under the strip will be unchanged, or only partly changed. The pigment cells in the skin itself are responding to the heat and light.

So far this all seems quite straightforward, but while the color play in anoles ranges from dark brown to light green, intermediate shades of light brown, yellow, yellowish green and emerald green are common. Furthermore, individuals are seldom uniformly colored but show different degrees of pigment on different portions of their bodies, and patterns of pigment are present along the back and tail of some animals and are absent in others.

The color is controlled both by the response to light by receptors in the skin and the eye. A third eye, the parietal, located in the top of the lizard's head, acts as a light receptor, but it may be a temperature detector as well. Signals pass through the pituitary gland that releases secretions carried by the circulatory system to the pigment cells in the skin. The skin receptors alone can cause complete expansion of the chromatophores so that the anole will turn a deep chestnut-brown. However, stimuli from light received by the eye can inhibit expansion of the chromatophores and control the amount of green exposed. Thus eye receptors dominate those found in the skin.

That anoles change color is a simple truth, and why they change color can be determined through careful observation and manipulation of conditions. How they change color is another matter. Just beneath the outer layer of the skin is a layer of yellow oil droplets and golden pigment cells. Below these are layers of parallel, but irregularly placed, cells. These cells serve as an interference layer, preventing light from reaching the next layer, the pigment cells, or melanophores. These are the only cells that are actively involved in the color change. The melanophores actually lie partly imbedded in the interference layer and partly in the deeper connective tissue between the skin and the lizard's body. Numerous fine branches extend upward from the cell bodies of the melanophores and continue to subdivide into smaller and smaller branches as they move upward. The finest branches terminate just beneath the outer wall of the skin.

When the anole is brown, the pigment granules are spread throughout the finer terminal branches of the pigment cells. In green anoles the pigment granules are withdrawn deep within the skin. The outer branches of the melanophores are practically transparent and the real color of the anole shows through the skin. The oil droplets, golden pigment cells and interference cells are stationary, but are important in that they act as filters and reflectors. Thus, anoles can exhibit their many colors. Stimulation from the skin and eye receptors simply forces or inhibits upward movement of the pigment granules.

Unlike anoles, some lizards actually do change their color to match backgrounds. Color-matching has been demonstrated in desert iguanas, fringe-toed sand lizards, zebra-tailed lizards and similar reptiles of the Southwestern deserts. The process is the same as it is for the anole—light increases, temperatures rise and colors change. As the environment becomes hotter, it is important for desert lizards to limit their solar heating.

Contrary to Southwestern folklore, desert-dwelling lizards do not carry sticks that they poke upright in the sand to provide shade. Nor do they plant such sticks so they can climb above the hot substrate. Instead, they avoid overheating by color transformation. Dark pigment granules retreat. The lighter-colored lizards not only reflect light better, but their changing coloration parallels and nearly matches the increasing reflective values of the sand. The night lizards of the Southwest do this, too. Only they match in reverse. As desert temperatures and light levels drop, their pigments darken, giving them protection from nocturnal predators.

The purpose of color change is clear in desert lizards. But what advantage is it to anoles, especially if it does not assist them in camouflage? One answer is that the color is a behavioral response indicating the anole's mood, allowing it to communicate with other anoles. Through such communication, submissive males can avoid fights and dominant ones can show off their colors and announce that they are the owners of territory. The females recognize those that are properly dressed. Dogs bark and raise tails to communicate similar objectives. We fly flags. When it is dark and the lizard is asleep, it may not matter what color the lizard is since other anoles can't see it and neither can predators. At rest (and in death) anoles assume the green color that takes no energy to maintain.

At cool temperatures and in bright light, anoles become brown because the dark skin is more effective in absorbing solar radiation. As the lizard gradually warms, it becomes more active and eventually shifts to green. The system works. In North Carolina, even on gray winter days, our anoles are active when other species of reptiles are dormant and wintering—protected in out-of-the-way places. On days when temperatures are high, it is important to absorb as little solar radiation as possible. The lizard does not want to further elevate its body temperature, so it turns green. Of course an anole is not a sedentary object, so it also moves in and out of the sun depending on the body temperature it is trying to maintain.

Like us, anoles are always changing their outfits to match the occasion. Cool temperatures require clothes different from what is needed on a warm day. And on certain social occasions, it is beneficial to be dressed properly. To communicate similar social objectives, we wear uniforms or ties. Anoles may not have wardrobes as elaborate as ours, but theirs in many ways are as functional. If you could see all those unworn ties hanging in my closet, you would think the anole's choices of color are better, too. ☒

*Mowing Schedules Altered*

# North Carolina Roadsides to be Managed for Wildlife

*Written and Edited by Vic Venters*

From now on, when you see a sign on the roadside marked "Roadside Wildlife Habitat," take a closer look. Some roadsides are being maintained especially to help wildlife.

Beginning in early summer, the N.C. Department of Transportation will kick off a roadside wildlife habitat-improvement program designed to enhance conditions for many wildlife species—especially those declining in recent years. These species include bobwhite quail, eastern meadowlark, cardinal, prairie warbler and the cottontail rabbit. Many common songbirds and small mammals also can find refuge alongside our roads.

With the assistance of the N.C. Wildlife Resources Commission, the Department of Transportation has developed a three-part habitat-improvement program:

- Sections of roadsides not directly adjacent to the road are being mowed less frequently so that they will provide more food and cover for wildlife. This improved food and cover can be critical particularly during the nesting seasons and at other times of the year when vegetation normally is sparse.
- Along roadsides that display the special wildlife habitat sign, the Department of Transportation will sow native plants to provide year-round homes for songbirds and other animals. This vegetation will complement the department's popular roadside wildflower program. These areas will also be periodically maintained to prevent trees from growing up in them.
- The mowing heights and schedules of the outer fringe areas of these roadsides have been adjusted on the advice of wildlife biologists to better fit the needs of wildlife.

Making sure that highway travel is safe and efficient remains the Department of Transportation's primary goal. Care is taken to develop wildlife cover in portions of right-of-ways away from the pavement, and in areas where the driver's view is not obstructed.

Biologists have also learned that roadside habitats do not significantly increase the number of birds and animals killed by traffic. That's because wildlife species inhabiting roadsides tend to travel parallel to the roads rather than across them. To further increase the safety for drivers, care is taken not to include plantings that attract larger animal species such as white-tailed deer.

Developing improved wildlife habitat along roadsides not only helps wildlife, it also can reduce some long-term mowing costs to North Carolina citizens.

The next time you take a trip and see the "Roadside Wildlife Habitat" sign, take a look at the side of the road. This sign means North Carolina's native songbirds and small animals have new places to live.

*Sherri Creech Johnson*
*N.C. Dept. of Transportation, Public Affairs*

KEN TAYLOR

***Less Mowing, More Wildlife:*** *Beginning this summer, the N.C. Department of Transportation will be managing selected roadsides for wildlife species such as birds and small mammals that utilize the grass and brush habitat found alongside roads and ditches.*

*Will Protect Water Supplies*

## Catawba Lands Conservancy Formed in Charlotte

A new land trust, The Catawba Lands Conservancy, has been formed in North Carolina to help protect the natural resources along the Catawba River basin.

Protecting drinking-water supplies is a primary goal for the Catawba Lands Conservancy. The Catawba River basin travels over 200 miles through 16 counties and 11 lakes. Over 2 million people use it for electricity, recreation and as a primary source of water supplies.

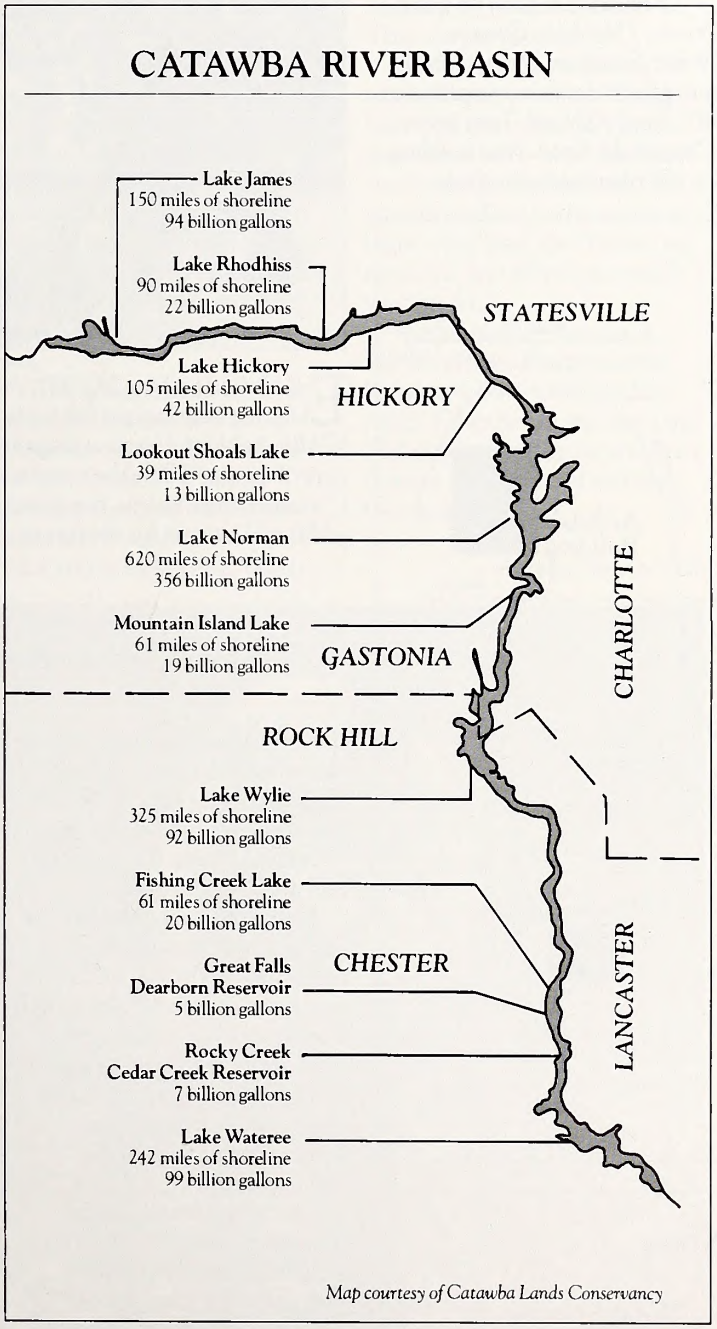
Among the first goals for the Conservancy will be protection of lands around Mountain Island Lake. This area includes land from Cowan's Ford Dam at Lake Norman south to Mountain Island Lake Dam at Lake Wylie and covers land in Gaston, Lincoln and Mecklenburg counties. "We're interested in preserving the natural and historic features of the region and at the same time protecting our drinking-water supplies in a region that is developing rapidly," said Mary A. McDaniel, president of the Catawba Lands Conservancy. "We want to work with local landowners and make them aware of the voluntary land preservation options that are available for protecting their lands."

Because the Conservancy is relatively new, the organization is actively seeking new members. People with local plant, animal, historical and cultural identification skills are needed also.

Land trusts acquire land through outright purchases, donations, and voluntary and purchased conservation easements. Often these lands are turned over to local or state government for parks, greenways or other natural areas.

Conservation easements are legal, binding agreements between landowners and the land trust in which the land remains in private hands. However, the owner or descendants sell or give up some development rights.

Donations are tax-deductible and memberships begin at $10. For more information, contact The Catawba Lands Conservancy, 1614 Fountain View, Charlotte, N.C. 28203.




***For Land and Water:*** *The Catawba Lands Conservancy has been formed to protect the natural resources along the Catawba River Basin. Over 2 million people use the basin for electricity, recreation and water supplies.*

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before traveling to an event. Listings for this calendar should be conservation-oriented and should be submitted four months in advance.

**May 23-24**

The N.C. Herpetological Society will hold its annual spring meeting at the N.C. Zoological Park in Asheboro. The meeting's major themes will be the native herps of Randolph County and the future of herps at the zoo. Program will include talks, live exhibits, zoo tours and field trips. For more information, contact the N.C. Herpetological Society, N.C. State Museum of Natural Sciences, P.O. Box 27647, Raleigh, N.C. 27611, or call (919) 733-7450.

## Raptor Predation Is a Complex Issue

Dear Editors:
Congratulations to *Wildlife in North Carolina* magazine for the excellent article "Breakthrough on Bobwhites?" The article handled the delicate issue of raptor predation in a professional way and covered the issue well. It may be difficult, but hunters need to be tolerant of other predators which have no idea of what prey they are killing, but must kill in order to survive.

*—Richard D. Brown, Ph.D., Founder, Carolina Raptor Center Inc.*

*Moved from Downtown*

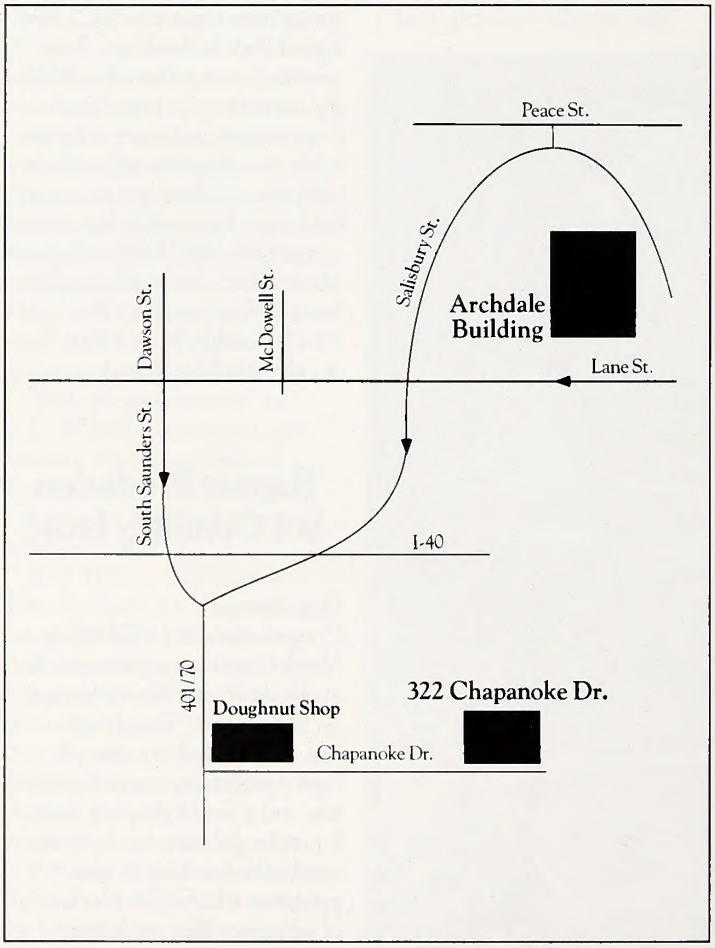
## Boat Titling, Registration in New Location

This winter, the Wildlife Commission's boat registration, boat titling and magazine subscription departments moved from their old Raleigh address at the Archdale Building, 512 N. Salisbury Street to 322 Chapanoke Road in Raleigh.

To reach the new office (from old office address), follow the directions on the map below.

Alternative 1: South on Salisbury Street until you reach U.S. 401 South/70 East. Turn left on Chapanoke Road. First building on left past doughnut shop.

Alternative 2: West on Lane Street, 2 blocks to Dawson Street, South on Dawson until you pass under two overpasses to 401 South/70 East. Turn left on Chapanoke Road. First building on left past doughnut shop.




### Field Notes

Wild turkey (bearded birds only) Through May 9

For more information on regulations, check the *1991-92 North Carolina Inland Fishing Hunting & Trapping Regulations Digest* available from license agents or the Wildlife Commission.

## Wildlife Endowment Fund Report

**Feb. 29, 1992**

Principal Balance
$1,664,959.29

Interest Earned
$9,022,755.85

Total Receipts
$25,665,715.14

Interest Used
$3,282,016.48

Fund Balance
$22,383,698.66

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

*Weigh on Certified Scales*

## Tips to Certify Record-Breaking Fish

If you've been lucky enough to land a fish large enough to qualify as a new state record, you'll need to follow a few procedures to get the fish qualified and in the record books.

In making an application, the angler should provide the common name of the fish species, its weight on certified scales, length from nose to tip of tail, girth, date caught, location, a name and address of a witness of the catch. If no witnesses were present, an affidavit of the catch is required.

One of the first things to remember is to get your fish weighed as soon as possible. Fish can quickly lose a lot of weight from body-moisture evaporation in the hot sun or from exposure to air.

The scales on which the fish is weighed are very important. They must be certified as accurate by the N.C. Department of Agriculture. Certified scales will bear a dated inspection certificate. Report that certification date, as well as the name and address of scale's location.

After weighing the fish, save it because a qualified expert will need to examine it. The Wildlife Commission will arrange for an expert to view your catch. The Wildlife Commission keeps only all-tackle records, and does not keep records on a line-class basis. Fish taken with nets, trot-lines, set-lines or specimens that have been snared, speared, snagged or shot do not qualify.

All data and information should be given in writing, and the angler should sign his name and provide a full-side view photo of the fish to: Division of Boating and Inland Fisheries, 512 N. Salisbury St., Raleigh, N.C. 27604-1188.

*Wins Two Awards*

## Worley Recognized as Enforcement Officer of Year

Lamar Worley has been called a lot of names in the past 24 years—rabbit sheriff, possum detective and game warden. Whatever the name, Worley got top billing last year for his enforcement of North Carolina wildlife laws.

Worley, born in Haywood County, received an award in February from the N.C. Wildlife Federation as the North Carolina Officer of the Year. He also was named North Carolina Wildlife Officer of the Year by the Southeastern Association of Fish and Wildlife Agencies.

Worley has enforced state wildlife laws for 24 years in North Carolina's Great Smoky Mountains. His knowledge of Madison, Haywood, Buncombe and Transylvania counties has brought more than wildlife violators to justice.

Drug dealers and murderers who have used the mountains as hideouts from the law are behind bars because Worley guessed where they were likely to hide. The 51-year-old wildlife officer, or game warden, as he prefers to be called, has written thousands of tickets for illegal night deer hunting and for exceeding fishing and hunting bag limits.

"Before I became a wildlife officer, I saw many people catch more than the limit when I was out fishing, and I used to think I would really like to catch those people," Worley said.

Worley became a wildlife officer in 1967. He had been a wildlife officer for two years when unknown assailants sprayed his house with gunfire. On another occasion, arsonists attempted to burn down Worley's house. One man served five years in jail for arson.

The Commission's decision to use deer decoys for battling poachers was popular with wildlife officers—especially Worley. He has constructed 10 decoys with ears, tails and heads that move by remote control. Currently, he's repairing one decoy whose head was shot off twice and its body struck with an arrow.

"We set up the decoy on the Sherwood Game Land in Haywood County," Worley said, recalling one incident last year. "A bow hunter came out of the woods about 45 minutes after sunset. (Deer hunting becomes illegal at half an hour after sunset.) As he drove by the decoy, he blinked his lights. I turned the decoy's head and wiggled his ears.

"The driver eased back and pulled out his bow and arrow. The arrow smacked the side of the deer decoy. The hunter looked at the bow, then at the deer, then leaned back on his truck and lit a cigarette. When we came toward him, he just smiled and said he knew we were close by and he was waiting for us to come out. Most people spin gravel to get away when they realize they've shot a decoy. This one just gave up."

Worley says bear cases are the most difficult to make. "People hunt bears here like they hunt deer down east—with dogs and trucks and radios." he said. "If you check them in the woods at night, they'll say they're hunting raccoons, and there's not much you can do."

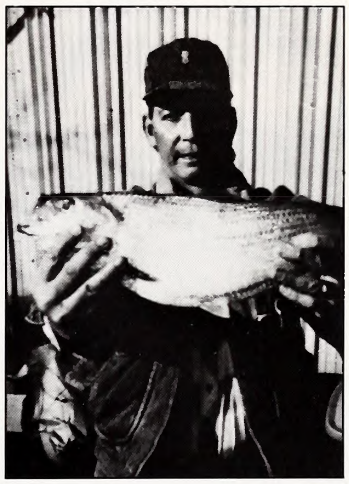
Worley is more than just a wildlife officer. He paints wildlife scenes, sews, makes Indian crafts, fishes and hunts, mats and frames prints and grows and dries flowers. He is married and has two daughters.

*—Angela Dorman Hill*

ANGELA DORMAN HILL

**Worley Awarded:** *Officer Lamar Worley won two awards for his outstanding work enforcing North Carolina's fish and game laws. The Commission's deer decoys, pictured with Worley, have proven especially effective in combating illegal night deer hunting.*

## Record Hickory Shad Caught

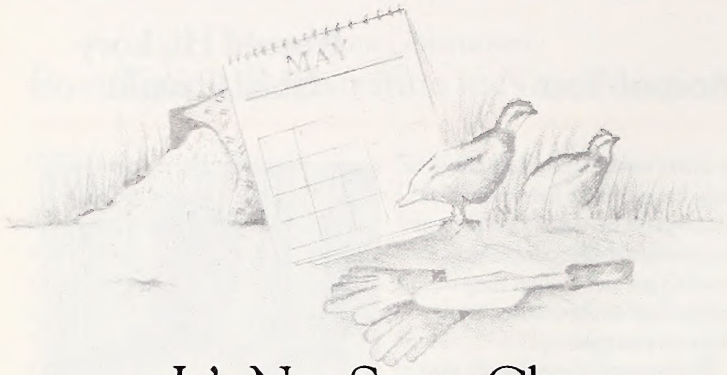


**Record Shad:** *Ralph Johnson pulled this new state- and possibly world-record hickory shad from the Tar River this February. The new record hit 3 pounds, 8 ounces.*

A new state-record—and possibly world-record—hickory shad was pulled from the waters of the Tar River this spring. The fish, weighing 3 pounds, 8 ounces, broke the previous state-record hickory shad that weighed 2 pounds, 14 ounces. At press time, the fish was awaiting certification as a new world record.

Angler Ralph D. Johnson of Raleigh caught the shad on 8-pound test line on a spinning rod on February 20. The fish bit a Nungesser spoon. Johnson, a long-time shad fisherman, at first thought the fish was a white shad, a species that grows larger than hickory shad. However, closer examination revealed he had an unusually large hickory shad. The shad was 20 inches long and had a girth of 12¼ inches.

The old state-record hickory shad, caught from Contentnea Creek last February by Richard McCarter of Kinston, was 19½-inches long and had a girth of 12 inches.




# It's Not Santa Claus

*by Vic Venters*

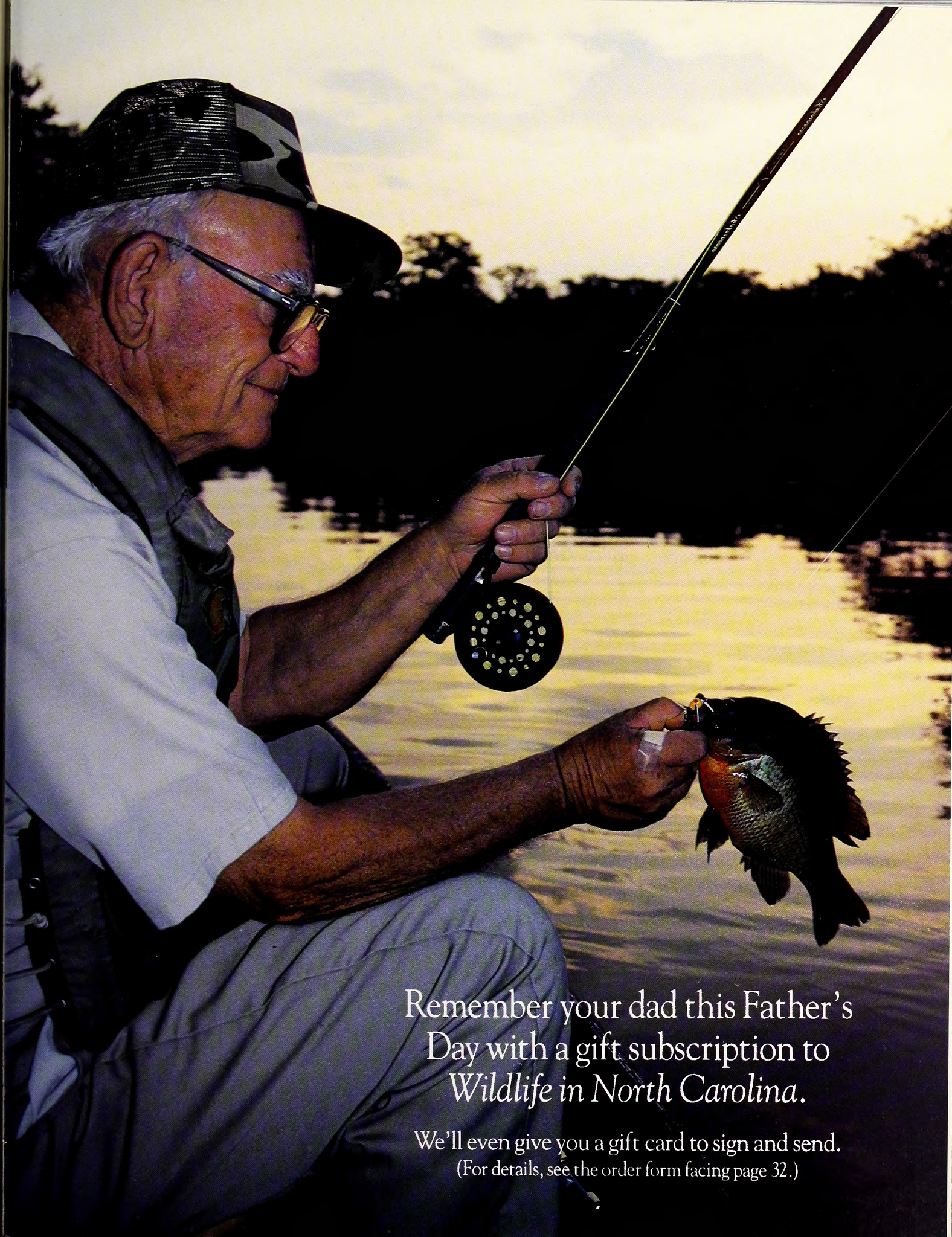
Hearing strange noises in your chimney? Don't worry, it's probably only a little gray bird celebrating the rites of spring.

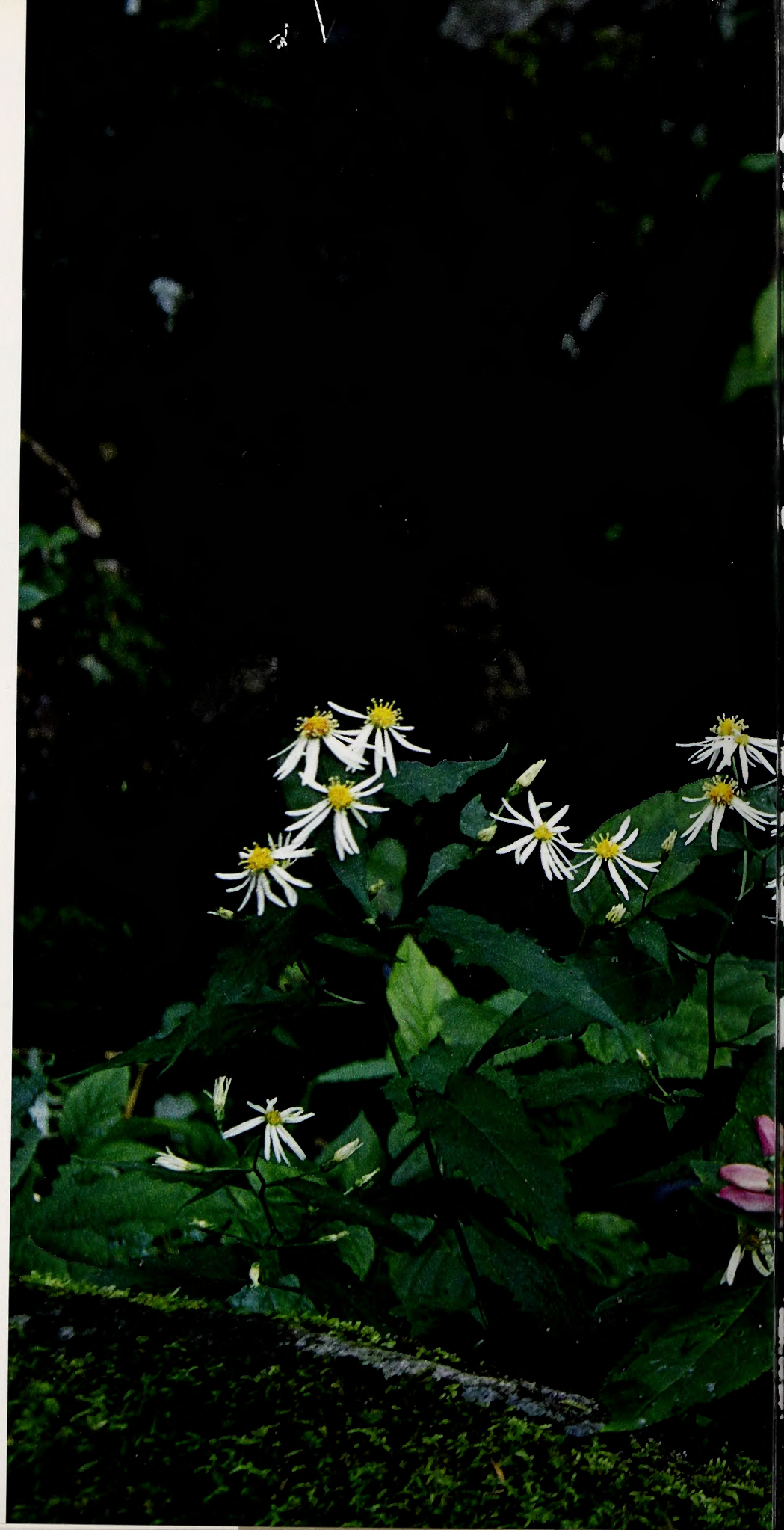
*Swift Songs:* Before chimneys and houses came along, swifts nested in hollow trees. Today, however, these bat-like birds are almost totally dependent on the nesting habitat provided by chimneys, hence the name chimney swift. Don't be surprised if they choose your chimney to nest in this spring.

Flocks of chimney swifts begin migrating to North Carolina in early spring. As breeding season approaches, the flocks will break up into numerous mated pairs. Breeding activities will usually begin this month, although some nesting takes place through July. The inner walls of chimneys are ideal sites for swifts to attach their cup-like nests which are made from saliva and small twigs and branches. If a pair of swifts has chosen your chimney, don't worry about any strange noises you may hear. It's only the young birds begging for food. The begging usually stops in three to four weeks as the birds mature. If the sound is bothersome, try closing the flue. You might also place a sheet of cardboard or foam or towels in the chimney to dampen the sounds. Although you may have to put up with a bit of noise, swifts provide excellent local insect control come summer, as they have a voracious appetite for flies, mosquitoes, and flying termites and ants.

Once you have an active chimney swift nest, don't disturb it. As migratory nongame birds, swifts are protected by both state and federal law. It is illegal to remove or otherwise harm the nests. If you wish to prevent swifts or other birds in your chimneys next year, consider placing a sheet of wire screen over the chimney top immediately after the winter. Swifts usually remain in North Carolina until November, then depart for wintering grounds farther south as cold weather approaches. Other cavity nesting wildlife species that may use your chimney in the spring are squirrels and wood ducks.

*Do Not Touch:* It's approaching the time of year when well-meaning people begin finding "orphaned" wildlife such as deer fawns. Almost invariably, however, the mother animal is quite near, perhaps hiding from you in nearby brush. Resist the urge to "rescue" the animals. Remember, these animals are adapted to living in the wild, and with their parents they can fend for themselves. Leave the area immediately so that the mother animal can reestablish contact with its young.


Remember your dad this Father's Day with a gift subscription to *Wildlife in North Carolina.*
We'll even give you a gift card to sign and send.
(For details, see the order form facing page 32.)



## Roan Garden

Though perhaps most renowned for it's colorful, early-summer blaze of rhododendron, Roan Mountain has many diverse habitats like this one along a plunging stream where white wood asters and pink turtlehead grow.

Second-class postage paid at
Raleigh, North Carolina

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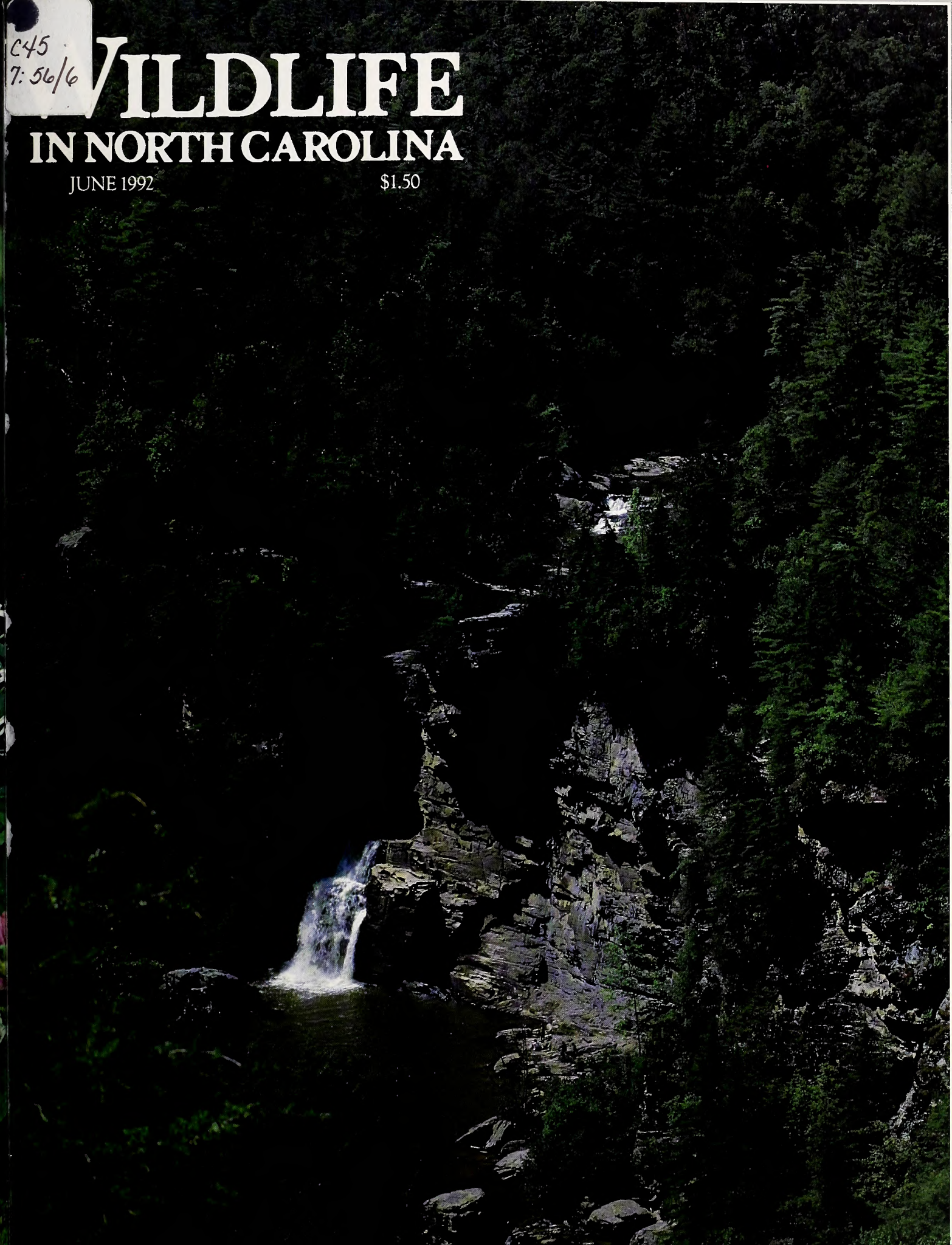
# WILDLIFE IN NORTH CAROLINA

JUNE 1992 $1.50



# Fishing for Small Rewards

*by Jim Dean*

I frequently drive past a pond not far from where I live, and for nearly two years it's been bone dry. Recent rains have partially refilled it, but the owner hasn't restocked it with fish, and probably never will. He uses it to irrigate crops, and even in years when there's ample rain, it's little more than a damp spot by August. Yet, on a bright, warm day this past spring, the urge to angle was apparently so irresistible that several fishermen sat along the bank watching motionless corks. Did those fishermen know? Did they care?

JIM DEAN

Pond fishing is such a gentle, easy-going pastime that floating a cork over barren water might rank as wisdom among those who don't want anything to interrupt a perfect day. Maybe that's what the late Robert Ruark had in mind when he wrote that "fishing is a state of mind." There are, however, fishermen who take their pond fishing seriously.

"You can have those big, crowded lakes," says one of my fishing buddies. "My butt gets sore bouncing on somebody else's wake all day. I'm getting too old to race around a lake trying to beat everybody to the best spots. I like a more relaxed pace. Besides, I catch more fish in ponds."

There's a lot of truth to that. Big lake fishing can be a monumental hassle, especially on weekends. You line up to launch your boat, and line up again to take it out. In between, you're likely to fish amidst a noisy, sometimes inconsiderate armada. Even good fishermen often have to work hard to find and catch fish. One answer is to get back to your roots and fish smaller waters.

I grew up fishing old mill backwaters and the dark waters of Coastal Plain rivers. I like to hear the light slap of tea-stained water against the side of a juniper skiff, and the rasp of redwing blackbirds in the reeds. In late afternoon, I want to be where I can hear a chorus of toads and bullfrogs. I'd rather cast to beds of lily pads or around the stumps of cypress than anywhere else. Those of us who live in the Piedmont, or farther west, can't always indulge such whims, but there are some very fine substitutes.

At last count, there were more than 100,000 farm ponds in North Carolina, and most of us also live near several smaller lakes or municipal water supplies. Almost all of these smaller waters receive less pressure than the big lakes. The fishing is often better, too. It's no secret that many of the state bass records from around the nation have come from farm ponds and small lakes. North Carolina's current state record largemouth was caught in a Union County pond just last year. It weighed 15 pounds and 14 ounces.

Fishing for bluegills and shellcrackers is particularly good in ponds. Do you know any massive reservoirs that regularly produce bluegills weighing a pound or more? A well-managed farm pond can easily produce such catches. Even if you can't find a pond that holds magnum bluegills and shellcrackers, you're not out of business. Ponds that have stunted populations of panfish are often prime places to hook that lunker largemouth.

If you've become frustrated fishing big lakes in recent years, let me offer a prescription. First, choose a local farm pond, old millpond or small lake. Chances are you know a landowner who will let you fish, but if not, ask your fishing buddies for a good lead or drive around through the country until you see a likely spot, then stop and ask permission to fish. If you promise to close gates, leave no trash and either release the fish or deliver a cleaned mess of bluegills to the owner, the odds of being allowed to fish are in your favor. It will also help to tell the owner that you won't return or bring other friends without asking in advance.

You can fish from the bank, but if you've got a small boat, all the better. Carry a couple of casting or spinning rods for bass, and a few favorite topwater and shallow-diving lures, plus a few soft plastic worms or lizards. Bring your ultra-light spinning rod with a few small lures for panfish and yearling bass. Finally, include your flyrod along with some small panfish poppers and a few sinking flies.

Try the bass first since they tend to be the most easily spooked, then switch to either ultra-light or a flyrod. Even if the pond is small, you can productively spend several hours switching back and forth between the various types of tackle.

Here are the guarantees. You will catch fish, probably lots of them, and maybe even a few big ones. You won't be competing with lots of other fishermen. You'll surely hear those redwings and toads, probably while you're eating a couple of sandwiches at twilight. And you'll wonder why in the world you'd ever want to fish anywhere else.

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Cover** *Linville Falls is perhaps the most familiar feature of the Linville River, one of four rivers designated as natural and scenic in North Carolina. Photographed by Ken Taylor.*

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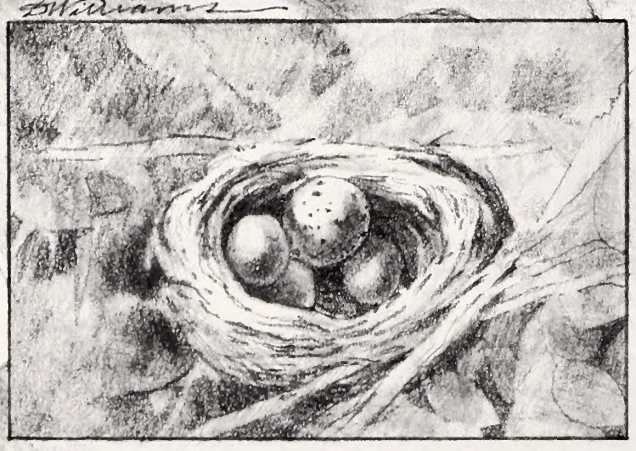
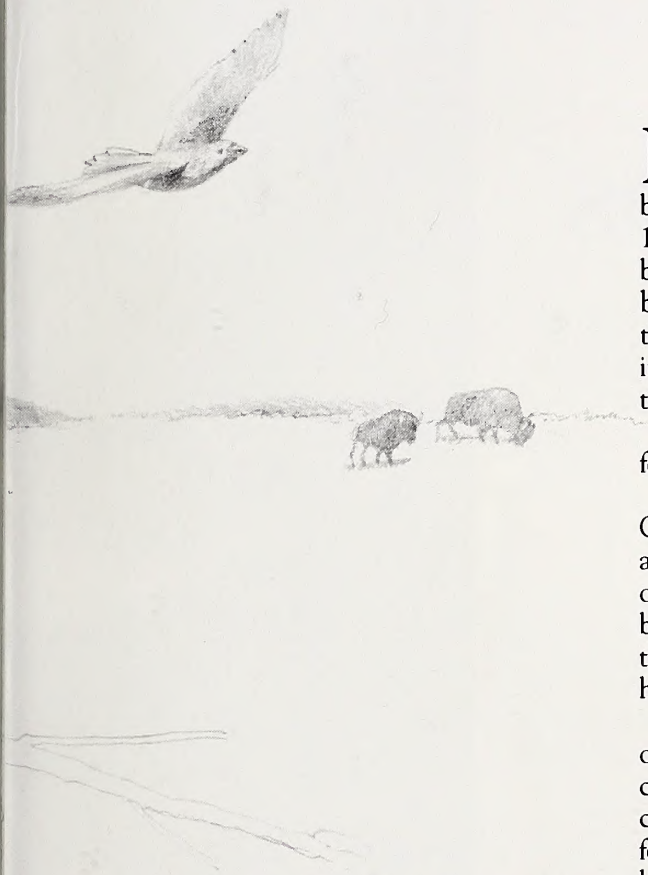


**Though a cowbird's egg** *may be larger than their own eggs, most birds don't recognize the difference and incubate the egg as if it were their own. About 220 bird species are parasitized by cowbirds, and about 144 accept the alien egg.*

**Yellow warblers** *are among the birds that do recognize the cowbird's egg. When their nest is parasitized, these warblers will build another nest on top of the old one. Sometimes as many as five nests will be built.*

**Robins have another strategy** *to deal with cowbirds. After recognizing the egg, they puncture it and knock it out of their nest. Other birds that recognize the egg may desert the nest entirely.*



**Brown-headed cowbirds** *are nest parasites. They lay their eggs in the nests of other bird species, often small birds such as warblers and flycatchers. The cowbird young outgrows its foster siblings and may even push them out of the nest. The cowbird's parasitic behavior may have developed because of its association with migrating buffalo herds on the western prairies.*

# Feathered Freeloader

*written by Lawrence S. Earley/illustrated by David Williams*

In recent years, concerned scientists have sounded an alarm over the accelerating decline of many of our North American migratory songbirds, especially those in the East (See "Wanderers in Trouble," Nov. 1989). The explanations for their decline have been various, but they basically come down to the loss and fragmentation of both their forested breeding habitats in North America and their wintering habitats south of the border. As forests are fragmented, songbirds that nest in the woodland interior suffer not only from increased predation at the edges, but also from the attentions of a notorious nest parasite, the brown-headed cowbird.

The cowbird is a good example of a species whose instincts, though perfectly natural, are increasingly harmful as its population grows.

Originally, the cowbird was confined to the open grasslands of the Great Plains, where migrating bison herds stirred up insects which the bird ate. East of the Mississippi lay the great Eastern hardwood forests, which offered no habitat for the bird. But as farms, towns and, later, highways, breached the forest wall, food sources and the open habitats favored by the cowbird grew plentiful. The bird's population exploded. The brown-headed cowbird today ranges everywhere in North America.

The instinctive nest parasitism exhibited by the bird is a rare trait; only one percent of all birds are nest parasites, including some ducks and cuckoos, but only the brown-headed cowbird and its cousin, the bronzed cowbird, entirely lack an instinct to build a nest of their own. Typically, a female cowbird will find a nesting pair of a host species, watching as they lay their eggs. Forest fragmentation means she'll be able to see the nests of songbirds that were hidden from her before. She'll remove an egg from the nest when the pair are away and deposit one of her own. Off the cowbird flies, having performed the first and last bit of parenting she'll ever do.

The cowbird egg hatches about a day sooner than the other bird eggs. The nestling also grows faster and is noisier than its foster siblings, and thus it gets more than its share of food. Quite often the young cowbird is so much larger than its nestmates that it crowds them right out of the nest.

As a result, birds whose nests have been parasitized produce fewer young than their non-parasitized brethren. In some areas the problem is so bad that humans have had to come to the rescue. In one area in Texas, for example, 90 percent of black-capped vireo nests were parasitized by cowbirds, requiring removal of the cowbird eggs by humans. Cowbirds pose a particular threat to the endangered Kirtland's warbler. Cowbirds have to be trapped and removed each year from the warbler's breeding areas in Michigan.

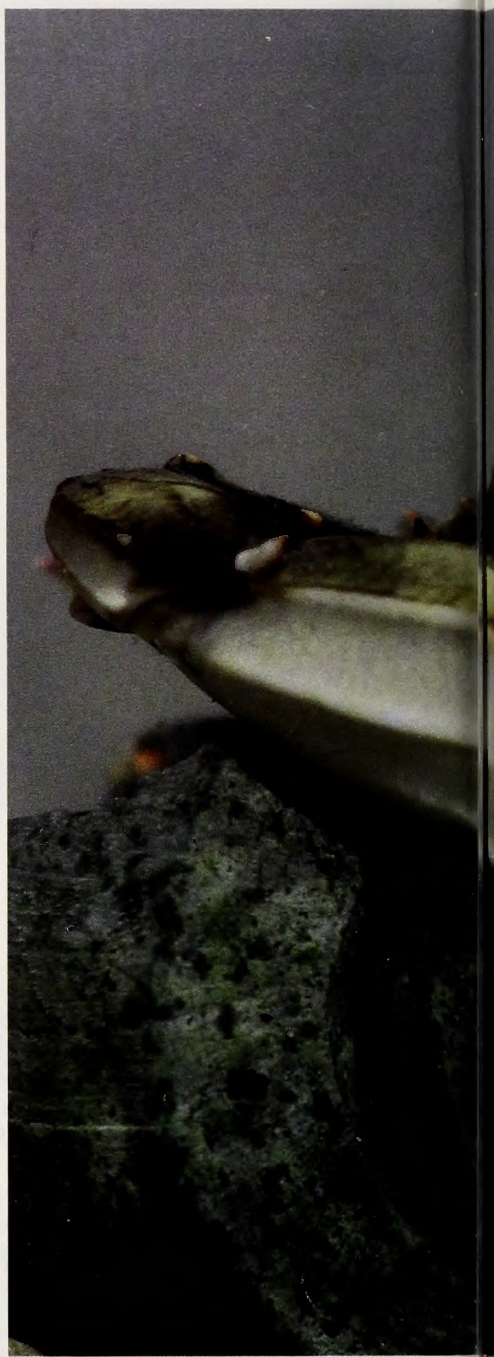
Of the 220 bird species known to be parasitized by cowbirds, about 144 will accept the new egg. These include neotropical migrants and forest-interior birds such as many warblers, vireos and flycatchers. Other species —such as robins, blue jays, cedar waxwings and brown thrashers—recognize the bogus egg and reject it, either by pushing it out of their nests or by building a new nest atop the old one.

The cowbird problem won't go away soon. It doesn't lack homes—new habitat is continually being made for cowbirds—and females have an astonishing rate of reproduction. They lay about 80 eggs over a two-year period, and though only 3 percent result in adult birds it's enough to double their population about every eight years. All of which means that cowbirds are a long-term threat to North Carolina's biological diversity.

# Blue Crabs & Bull Lips

What can you say about a blue crab? That it is handsome; that it leads a fascinating life; that it is a rising star in the seafood industry; that it is delicious? Of course.

written by Lundie Spence ©1992
photographed by Melissa McGaw



On a late afternoon in spring some years ago, I was riding the Cedar Island ferry to Ocracoke. My car was securely parked on the deck, chocks behind the wheels. Not wanting to spend the three-hour trip in the confines of my car, I began wandering the decks of this water-borne bus.

The ferry was nearly empty so the crew wasn't busy and had time to talk. I was new to North Carolina and eager to learn about people who earned their living from coastal water, so I asked a few questions and listened. But soon I was distracted by a wonderful aroma seeping from the steering house. The stories of bad storms and shallows shifted to food, cooking and crabs. With a generous nod, I was invited to join in the midday meal.

A large pot sat on a burner leaking steam. The mate lifted the lid and I could see a giant dumpling simmering in the stew juices. "Done," he said and began ladling pieces of dumpling, potatoes, onion, quarters of blue crab and a rich white broth into bowls.

Since I was unaccustomed to seeing whole quarters of crab swimming in stew, I watched the others to see how to manage this crabby concoction in polite company. My companions used their spoons to scoop up the potatoes and their dumpling to sop up the sauce. But when it came to the crabs, they just used their fingers. The cooking had softened the shell so it was easy to get to the meat.

The mate said that this was a coastal specialty—one of those meals where you roll up your sleeves and let the juices drip off your elbows. It was the kind of dish meant to be eaten with home folks in back yards or warm kitchens. I was proud to be sitting there in the lee of the wind with these people.

Blue crabs are part of the fabric that is woven from the coast and its people. Running one way are the strong threads that form the environment: the salty estuaries; the nutrient- and soil-laden rivers; the fringing salt marshes and the underwater meadows of seagrass. Across these threads run the fibers of the people who have caught crabs as long as they have lived near the salt water.

The first crabbers were native Americans who came to the coast seasonally to capture the bounty. Then came the colonists who supplemented their diet with crabs, oysters, clams and fish. Later, as demand increased, watermen turned crabbing into a business. Today, catching hard crabs is a livelihood for small-boat fishermen, but a crab-shedding industry to supply soft-shell crabs has grabbed the limelight as the lucrative sideline to this age-old fishery.

***Commercial crabbing emerged*** in the 1800s. Early crabbers nabbed their catch using trotlines, and these are still used occasionally today. Baits were tied directly to a long line with a slip knot. The line might reach from half a mile to a mile. At first light, the crabber, often alone, would pole his boat along the trotline, lifting it gently to bring the bait and greedy crab close to the surface. With a quick swipe of his net, the crabber would seize his catch and dump it into the boat. Then a new bait would be tied on the line.

If you spend any time talking about trotline crabbing to old timers, you'll soon hear about bull lips. They were the crabber's secret bait. Watermen salted the bull lips, or possibly beef ears or tails, until they were well-brined and tough. This gave them tough crab bait that only the most determined crab could steal. When bull lips became scarce, crabbers turned to eels for bait. A well-brined section of eel wasn't as tough as a bull's lips, but eel was a good second choice. In fact, for many years, the main use for most of the eels caught in North Carolina was as crab bait.

Trotline technology took a quantum leap when the "patent dipper" was invented after the turn of the century. Attached to the side

of the boat, the patent dipper lifted the line over a net while the crabber steered his motor boat down the line. Because the dipper made crabbing an easier job, trotlines got longer and more people got into the business.

The next innovation changed crabbing history. Wire-mesh crab pots, probably developed in Virginia, trapped multiple crabs inside a cage and prevented their escape. Following the smell of bait, crabs crawl into one of four funnel-shaped holes in the pots. Once inside, the crabs are lured by the bait through several internal compartments and are unable to find their way back out. Crabbers use fish—menhaden, undersized trout, spot or grunts—as bait. Some fish-house owners make a sizeable part of their living providing crabbers with bait.

To locate their pots, watermen tie a line with a buoy to each pot before it is dropped into the water. The pots may be placed in shallow or deep water, wherever the fisherman has been having the most success. Each float has painted stripes or bars and a number to identify its owner. Pity the poacher who is found lifting the wrong pots.

More recently, there have been refinements in the hard-crabbing industry that have increased efficiency. There are hydraulic or electric pot pullers, and the wire mesh of the pots is coated with plastic. Using the pot puller, the crabber hooks the float and wraps the line around a hydraulic winch that hauls up the pot. After shaking out his catch, the

***The blue crab possesses** excellent eyesight, and is able to detect motion in almost a full circle. With tiny hairs on its legs and with its mouth, it can also "smell" and detect food or chemicals in the water. Like many fish, crabs seem to feed most actively at dusk and dawn.*

***Crabbing remains an important** part of North Carolina's commercial fishery. The eggs on this female crab, shown extruding from her abdomen, are used in a number of traditional coastal crab recipes, most notably she-crab soup. Adult females can hold up to 2 million eggs per brood.*

waterman baits the trap and returns it to the water. In spite of the strenuous effort of manually hauling aboard the pots, crabbers tend 200 to 600 pots a day. With the crab puller to help do the work, crabbers can set over 1,000 pots and still be finished by early afternoon.

To cull crabs too small to be legally caught, the N.C. Division of Marine Fisheries and Tar Heel crabbers have worked together to develop "escape rings" to sort the catch naturally. Now at least two escape rings are required on all pots.

With the decline of the trotline industry and increased regulation of potting techniques, crabbers turned to trawling from the 1950s through the 1970s. Shrimp-trawling gear was modified with larger mesh and heavier webbing, and watermen fished for crabs during spring and fall, concentrating on the more valuable shrimp during the summer. Over 50 percent of the crabs harvested in the 1960s came from trawling. Now, less than 5 percent of the catch depends on this gear.

Scrapers and dredges are other kinds of equipment used to harvest these crustaceans. These devices are iron-bound boxes that are dragged over the bottom. Scrapers are used in seagrass beds to scoop up crabs. Iron-toothed dredges wrest burrowed crabs from the protection of the mud during winter months; however, dredges are allowed only from January until March in northern Pamlico Sound.

***Understanding the hardware*** for catching hard crabs is only half the commercial story. Soft-shell crabs—those delectable, fried, spidery-looking taste treats—are a big business in North Carolina. If it sounds odd that the same blue crab can be both hard and soft, then take a moment to consider the biology of the blue crab.

We have our skeletons on the inside of our bodies, but with crabs, it's quite the opposite. That hard covering is the carapace, and muscles are attached to it. A crab's shell or carapace does not grow or stretch, so the only way a little crab can get bigger is to shed that carapace by molting. For a crab, the period during

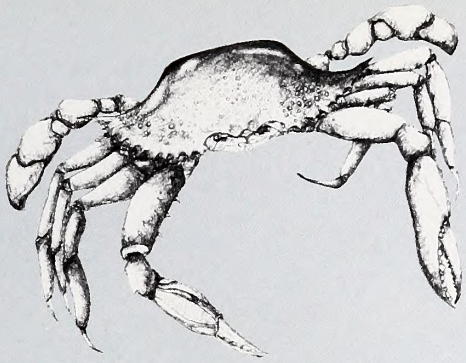
which it is molting is the most dangerous time of its life. For a few days before each molt, the crab lies low in the grassbeds or in the shadows at the edges of tidal creeks. Then the crab "busts," or molts. A very soft-skinned crab eases its body slowly from the old shell, the old eyestalks and the old legs. At first, the crab is crinkly looking until it absorbs water to plump out the wrinkles. Without a stiff carapace, the muscles have no leverage so the crab is helpless. However, within a day, the soft skin hardens and the now much larger crab returns to the business of feeding. These newly shed crabs are nicknamed "whitebellies" in contrast to the rusty colored undersides of crabs that haven't shed in a while.

The sex of a blue crab can easily be determined by looking at the underside or belly. The "jimmy," or male crab, has a T-shaped abdomen. The female crab also has an abdomen that not only identifies her sex but also her level of maturation. The "sally crab" is an immature female with a V-shaped abdomen. The "sook" is the mature female, and her abdomen is U-shaped. Her last or terminal molt is that point in her life at which she must mate to reproduce.

From an observer's perspective, the terminal molt has all the features of a love story, but it's important to remember that these behaviors are guided by instincts for survival. As the female's terminal molt approaches, she emits chemicals—pheromones—into the waters that attract males. The males wave their swimming paddle fins and claws in an underwater dance of courtship. One male will finally grab the female and cradle her under him with four of his six walking legs. He will seek a protected site and hold her until she sheds. After the female molts, the male inserts his sperm into her receptacle. When her shell hardens, he leaves, never to see her again. Crabbers have a lot of names for this mating couple—a doubler, the chandler and his wife, or a buck and rider.

The rest of the life cycle is equally fascinating. Once mated, the female will produce eggs that spring and possibly the following spring. Since she can hold up to 2 million eggs per brood, each female has the potential to produce 4 million young. After mating in low-salinity marsh waters, the female migrates to saltier waters. Fertilized eggs are extruded under her U-shaped abdomen, pressing it open. We can determine the maturity of the eggs from their color. At first, they are bright orange. Just before they are released into the water, the eggs turn rusty red. Crabbers call egg-laden females "sponge," "berried" or "she-crabs." The eggs are the basis for the famous she-crab soup.

Mother crabs release their newly hatched larvae near inlets in the higher salinity waters of the ocean. The larvae progress through



# Blue Crab Recipes

### *Hard Crab Stew*

2 dozen hard crabs, cleaned
3 small onions, chopped
salt and pepper to taste
10 medium white potatoes, cubed
¼ cup bacon drippings

Mix ingredients together in pot, cover with water and boil until done. Cornmeal dumplings may be added about 15 minutes before the potatoes are done. (Do not remove pot lid while dumplings are cooking.) If dumplings are not desired, thicken stew with a little cornmeal just before stew is done. Serves six.

### *Carolina She-Crab Soup*

2 cups white crab meat
1 pint milk
1 pint cream
¼ cup crab roe (may substitute 1 boiled, chopped chicken egg yolk)
¼ cup cracker crumbs
½ stick butter
⅛ teaspoon pepper
2 teaspoons sherry
⅛ teaspoon mace
⅛ grated onion
salt to taste

Put milk in double boiler with mace. Allow to simmer a few minutes. Add crab, roe (or egg yolk), butter, cream, and cook 15 minutes. Thicken with ¼ cup cracker crumbs and season with salt, pepper and onion. Allow to stand on back of stove to bring out flavor, adding sherry just before serving.

### *Batter-fried Soft-shell Crabs*

Soft-shell crabs, cleaned (2 per person)
Oil for frying
*Batter:*
1 cup flour
1 egg yolk
4 tablespoons beer
¼ teaspoon salt
5 tablespoons milk
5 tablespoons cold water
1 egg white

Pour flour into large bowl. Make well in center and add egg yolk, beer and salt. Stir until well-mixed. Combine milk and water; add half to batter. Stir until smooth. Add rest, 1 tablespoon at a time, adding only enough to give right texture. For light mixture, let batter rest at room temperature for at least 30 minutes. Beat egg white stiff. Gently and thoroughly fold into batter. Dip crabs in batter. Fry in hot oil (350-375 degrees) about five minutes, or until golden brown. Drain on absorbent paper.

### *Soft-shell Crabs with Garlic Sauce*

12 soft-shell crabs, cleaned (2 per person)
1 cup buttermilk baking mix
½ teaspoon cayenne pepper
¼ teaspoon freshly ground black pepper
¾ cup butter or margarine
2 small cloves garlic, crushed
4 tablespoons fresh lemon juice
2 tablespoons fresh parsley, finely minced

Dredge crabs with flour seasoned with cayenne and black pepper. Heat butter in large, heavy skillet and when hot, add crabs. Cook until golden brown on both sides, about four to five minutes on each side. Remove to warm platter. Add garlic to skillet and stir quickly, then add lemon juice. Pour sauce over crabs and sprinkle with parsley. Serves six.

### *Crab Salad with Tarragon*

1 pound backfin crab meat
½ cup finely chopped red onion
½ cup finely chopped celery
1/3 cup finely chopped green pepper
3 tablespoons finely minced fresh parsley
1 tablespoon chopped fresh tarragon
½ cup reduced-calorie mayonnaise
1 tablespoon fresh lime juice
¼ teaspoon white pepper
lettuce leaves

Place crab meat in large bowl and add all other ingredients except lettuce. Mix gently but thoroughly. Chill thoroughly. Make bed of lettuce on individual salad plates. Place equal amounts of salad on each. Serves four to six.

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*Many of these recipes are derived from* Mariner's Menu, *a free, quarterly publication of Joyce Taylor's tested seafood recipes. To receive this publication, send your name and address to UNC Sea Grant, Box 8605, NCSU, Raleigh, N.C. 27695-8605.*

***Many blue crabs** are graded by size (left), then sent up North where they are popular table fare. The hard shells on crabs do not stretch, so the crabs must molt or shed their old shells (right) in order to grow larger. After shedding, crabs remain soft-shelled for a short period.*

diverse body shapes before finally metamorphosing into a tiny, but recognizable, crab shape. Larval crabs swim weakly with the currents, filtering smaller phytoplankton and zooplankton for nourishment.

Knowing about the crab's life can solve a mystery for swimmers and surfers. Zoeae—one of the larval forms—are prevalent in Carolina coastal waters during June and July. Though very tiny, they are big-eyed creatures with a long spine on the head and a segmented tail reminiscent of a lobster. That miniscule spine, however, can prick a swimmer's skin like a little stinger. Jellyfish may get the blame for the irritation the swimmer feels, but the culprit is usually crab larvae. Tiny crabs, molting every few days, use tidal currents and other means to make their way into the quiet back waters of the sounds. The estuary is their home, and they use all parts of it in their life cycle.

Blue crabs mature in 15 to 20 months, eating their way through life, and they are efficient predators. The claws of female crabs tend to have red tips as if they had painted their nails. One claw has knobby teeth and is the crusher. Shells of young clams and oysters crack under its pressure. The other claw has sharper teeth and is the ripper and shredder. Both are powerful as anyone who has been nipped by a blue crab can attest.

Blue crabs have excellent vision. Their stalked eyes can detect motion in almost a full circle. In addition, crabs are sensitive to chemicals in the water, "smelling" the water with their mouths and with hairs on their legs. Their senses enable them to locate a meal, whether it is fresh fish, shelled mussels and clams or something dead, and they will eat almost anything. In fact, crabs are not above a little cannibalism. Marine aquarists will tell you about putting two blue crabs together in a tank only to discover the next day that only a single blue crab remains.

Tom and Donna Wolcott, marine biologists at North Carolina State University, have conducted some complex experiments with blue crabs and their feeding habits. They inserted tiny electrodes into the crab's chewing muscles. A small transmitter on the crab's back sensed feeding activity and relayed this information via bursts of high-frequency sound to a receiver at the surface. Thus they could track the crab and find out when and where it fed. They discovered that crabs seem to feed most frequently at dawn and at dusk.

***Although blue crabs*** range in the estuaries from Nova Scotia to the south of Texas, major commercial harvests occur in the Gulf of Mexico near Louisiana, the Chesapeake Bay and in North Carolina. During the spring, summer and early fall, estuarine waters are dotted with crab pot floats. Male hard crabs must be more than 5 inches across the breadth of the carapace to be legal for harvest; however, any mature female can be caught. Males tend to grow larger than females since they molt throughout their lives. Crabbers either sell crabs live to restaurants or sell their catch to processing plants where workers with very nimble fingers pick the cooked meat from bright red steamed shells.

In 1991, a bumper harvest of more than 40 million pounds of crabs worth about $9 million was harvested from Tar Heel waters, and hard crabs have become one of North Carolina's most important fisheries. This includes volume, employment, processing and gear purchases. The fishery is entirely estuarine, and more than 40 plants operate to process hard crabs. Most are located along Pamlico Sound. Giant baskets roll into steamers that cook the crabs. The red crustaceans are dumped on picking tables where workers extract the meat. Some of the best pickers can pick 50 to 70 pounds of crab meat a day.

Crab meat products can be fresh, pasteurized, canned or frozen. Since it's all hand-picked, it's expensive. The most valued is the lump meat from the back fin. You can also buy mixed or claw meat. Joyce Taylor, Sea Grant's seafood education specialist, has developed recipes that mix crab meat with mild, cooked fish flesh. The taste of crab overpowers the fish. Cooked hard crabs, steamed or boiled, have a culture of devotees who swear by certain hot spices, vinegars or beers in preparation. For some reason, North Carolinians have never had the passion for hard crabs that you find in Baltimore, Philadelphia or New York. Therefore, a lot of our crabs are shipped north.

Even so, sauteed or fried soft crabs have a growing fan club here and elsewhere. It may be a little disconcerting for a novice to see a plate with two golden-fried crabs, legs and all. But after a tentative nibble on a crisp leg segment and a bite into the succulent quarter, a new member is ready for the club. With soft-shell fans increasing, the demand for soft crab continues to outstrip supply. The result is that crab shedding has become a big business in North Carolina. New technology and understanding of water quality has enabled the industry to become sophisticated. But again, the biology is critical to the industry. Soft crabs are those that are newly molted. They are about three hours old and recently pumped full of water. If they are left too long, the carapace starts to harden and the crab is called a "papershell." A papershell has a much lower market value.

When crabs emerge from the winter doldrums in the early spring, they start to feed and soon need to shed. Water temperature plays a big role in the timing, but the moon has its influence. The first full moon in May is typically the time for the greatest shedding. Crabs that are about to shed are called "peelers." It's a skill and an art to recognize a crab's impending molt, but veterans can look at the back flipper or nick a claw to tell if that crab will shed in a few hours, two hours, five hours or 20 days. Special crab pots catch peelers, and that's a business in itself. These peelers are sold to a crab shedder or the watermen sheds the crabs himself.

Peelers are carefully placed in large shallow tanks with circulating water. It is important that the water stay at the right temperature and full of oxygen, otherwise the peelers will die. Of course, any impurities such as excess ammonia in the water can also cause problems. Peelers must be watched 24 hours a day. This is a labor-intensive business. After the crab molts, the shedder waits three hours and then moves it to a box of seaweed. The soft crabs are then kept alive in a refrigerated room, before being shipped to their final destination.

Murray Bridges, one of the pioneers of crab shedding, lives on Collington Island in Dare County. During the first full spring moon after water temperatures have warmed, Bridges and his crew may shed over 12,000 crabs in 24 hours. Most shedding operations in North Carolina are close to tidal creeks. Water is continuously pumped from these creeks through wooden or concrete trays. Strings of lights hang overhead so shedders can work through the night.

Some newer shedding operations use closed, recirculating systems, which means shedding operations can now be placed away from the water where land is less expensive. However, maintaining high water quality through filters still needs refining.

***The soft-shell crab business*** is still expanding. In 1980, 87,000 pounds of soft-shell crabs worth $130,000 were harvested in North Carolina. In 1991, more than 750,000 pounds brought in $1.4 million to shedders. The best year ever, 1990, saw crabbers harvesting slightly more than 1 million pounds of soft crabs worth about $2 million. Soft-shell crabs come in all sizes and are named accordingly. The New York hors d'oeuvre trade likes "roaches"—soft shells less than three inches across. Then there are mediums, hotels, primes, jumbos and whales. The whales measure more than 5½ inches across. A few processors are freezing cleaned crabs so restaurants can serve them all year.

According to crabbers, biologists and the N.C. Division of Marine Fisheries, blue crab stocks are abundant and there are few problems with the industry. Scrap shells from the processing plants pose a solid waste issue; however, research is developing applications for the shells. In fact, chitin, the substance in the shell, has been transformed into several medical products such as sutures and bandages.

If you're spending time at the beach this summer, try a little soundside crabbing. Get a line (about 20 feet), some bait—fish heads or chicken necks—and a long dip net. After tying your bait on the line, lower it from a dock or toss it gently into a tidal creek. Wait for the little tug that lets you know a crab is trying to scuttle off with your bait. Very slowly draw in your line until you see the crab. Then quickly net the crab and lift your catch out to a waiting bucket.

If you must remove an entangled crab from the net, carefully grab it by the base of the back swim flipper and pull it from the net. Watch your fingers. There must be 50 ways to get nipped by a feisty blue crab. If it happens to you, hold the crab over or in water. Never try to pull it off or sling your hand. Ouch!

Cover the bucket to keep the crabs from drying out. Once you have a half dozen or so, march proudly back into your cottage and cook them up. Twenty minutes of steaming and the blue-green carapaces turn bright red. You can add your favorite spices to the pot. Call in a friend or two and enjoy the bounty of our coastal heritage. ☒

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*Lundie Spence is an educator with the UNC Sea Grant Program at N.C. State University.*

# Backpacking Basics

## Hiking into the boondocks and setting up housekeeping doesn't have to be a disaster. Take this veteran backpacker's word for it.

written and photographed
by Eddie Nickens ©1992

One by one, we made it to the top. First Lee and Kevin—tennis player and weekend farmer, respectively—with lungs stronger than the rest of our gang. Next my brother Mark, volleyball nut, with legs honed by leaping and lunging a couple of times a week. And bringing up the wayward rear, wheezing all the way, we three desk jockeys: myself and Bill, the hospital veep, and George, the high-risk insurance guy.

We'd climbed 2,856 feet in five miles of hiking with rarely a level step, from Walnut Bottom on Big Creek in the northeast corner of the Great Smoky Mountains National Park, up Flint Rock Cove, across McGinty and John Back creeks and a handful of unnamed trickles, through the dale that falls off the flanks of Seven Mile Ridge and to the saddle of Pretty Hollow Gap, elevation 5,179 feet above sea level. With 45 pounds on our backs we stripped off long sleeves a half-hour into the hike. Halfway up the mountain my shirt was soaked in sweat, belying an air temperature of some 45 degrees. We'd begun a laughing, joking bunched-up group of trekkers far, far below; now we were strung out along the trail like charms on a schoolgirl's bracelet, each settled into our individual pace, one foot in front of the other, time and time again, the creaking of a pack strap providing a cadence to march by.

When finally we made landfall on the small meadow atop Mount Sterling, we shucked off our packs and sucked air, so fatigued we were hardly able to look around. Only when we stood straight up again—hands off our knees, eyes off the ground—did we realize just where we were. To the east, the bulk of the Great Smoky Mountains sprawled like a great rumpled quilt tossed to the edge of the world—Big Cataloochee and Mount Hardison and Snake Den Mountain all marching above the unbroken wilderness. To the west, the shimmering curve of the Pigeon River oozed between other distant mountains. Glimmering in the sunlight was the tiny spire of Little Cataloochee Church, nestled between Noland Gap and Fork Mountain.

We were on top of the world. We looked around and saw that it was good. And worth it. No doubt about that—it was worth every step.

That's the feeling of a backpacking trip. For hours and miles, you invest your own sweat equity into putting yourself far from the crowd. It is work—but good, clean, fun work, like chopping wood. And if you own a sleeping bag and a pair of hiking boots, sooner or later, you're going to want to give it a try.

You may not be interested in a mountaintop. Perhaps you'd like to hike the Outer Banks, or tackle only the foothills on your first try at backpacking. But whatever your ultimate destination, one thing is for sure. Backpacking is a different enterprise altogether from camping by car. You need some basic instruction, a backpacking primer, sort of a *Pilgrim's Progress* of making it out there on your own.

Welcome to class. Tops on the list is gearing up. Anyone considering a first-time backpacking trip probably has some camping experience, whether with an organized group or with what is referred to as "Cadillac camping"—i.e., load up a car with as much junk as you could possibly need in a weekend, add tent and bedroll and dash off to your favorite flat spot in the woods. Indeed, some equipment lists for backpacking would require the assistance of a spare Sherpa or two. For the first-time backpacker planning a one- or two-night jaunt, I don't think you'll need a flare gun or mini hammock.

What you will need, as your third-grade biology teacher taught you, are life's three basic necessities: food, shelter and water. Let's start with shelter, for that's where special equipment needs are most obvious.

Most basic camping paraphernalia, such as a sleeping bag and tent can, under mild weather conditions, double as introductory backpacking gear. Sure, the techno-weenies out there might snicker at your sleeping bag with its *Peanuts* lining, but this is just a beginning. You only need to test the backpacking waters a bit before taking the full plunge of gear purchase. Plenty of time, and more than ample opportunity, for that later.

If you have neither bag nor tent, or if you're heading out in the spring or fall shoulder seasons, you might want to consider renting high-tech gear from an outdoor-sporting goods store. My friend, George, backpacks only once or twice a year, so he rents a sleeping bag and sleeping pad for less than $15 for a long weekend. At that rate, he figures, he can rent twice a year for 10 years and still not pay what he'd have to in order to own gear of equivalent quality. It's not a bad system, and one that can be applied to backpacks, tents and cookstoves as well. By renting, you'll be able to acquire a taste for backpacking's rigors and rewards. You'll also be better acquainted with the sport's demands on equipment, and better informed about buying your own.

I'd suggest an external frame pack to begin with, because many packs with internal frames need to be specially fitted. For now, go with a synthetic fill bag—if you're on a beginner's trip, you probably won't need down's insulating abilities, and you certainly don't need down's maintenance requirements and expense. For 10 bucks and a handful of change you can buy an Ensolite sleeping pad, but you'll be happier renting a self-inflating pad, which puts a layer of air between your soft back and the hard ground. And don't scrimp on the stove. You may envision yourself cooking over an open fire, but it ain't gonna happen. Ask your sporting goods dealer about a simple-to-operate white gas cookstove along the lines of Coleman's Peak 1.

One thing you'll have to buy, of course, is food. Shopping to outfit the transportable kitchen is no easy task. Perhaps no other part of backpacking is as alien to the beginner as this, for preparing lightweight meals to fuel backpacking's heavyweight energy demands requires a bit of culinary creativity.

Weight is, of course, an important consideration, but the other key words to keep in

***A properly loaded backpack** allows you to carry more gear in comfort. Heavy, bulky items should always be placed near the bottom of the pack, keeping the center of gravity low so that your hips bear the weight instead of your shoulders.*

***Backpacking meals** should be high in carbohydrates to provide energy for your hikes, but must also be light in weight. Freeze-dried dehydrated camping foods are now readily available and are even tasty, although off-the-shelf grocery items are often just as suitable and much cheaper.*

mind are "compactible" and "carbohydrates." Your victuals should be compactible because they're likely to be stuffed into the most remote corners of your pack, there to grind against tent stakes and candle lanterns and likely turn into powder. They should be comprised largely of carbohydrates because they are easily converted into usuable muscle energy.

That means pastas, rices and noodles are all "fare" game. In fact, I can't think of many backpacking suppers that weren't built on a foundation of some sort of rice or noodle. Some of our favorite trail dinners include Chinese noodles with chunk salmon and walnuts in lemon-ginger sauce (we pack a few lemons and fresh ginger to make our own); fettucini with Parmesan sauce and tinned chicken with peas; and Louisiana black beans and rice. For lunch we go light: bagels with cheese and salami generally suffice. Breakfasts are equally low maintenance, with packaged grits and oatmeal and Pop-Tarts heading the menu, though some of my backpacking pals will routinely razzle-dazzle the group with homemade hash browns or an egg, cheese and potato casserole. Just make sure that your meals require only the addition of water, not milk, so as to keep cans to a minimum.

For a while, dehydrated backpacking foods were all the rage. These days I augment grocery-shelf items with specialized dehydrated fill-ins when necessary, but I find 95 percent of my backpacking foods in the neighborhood grocery store. Freeze-dried peas are a welcome addition to pasta dishes, and weigh next to nothing. Dried fruits can spice up mundane dishes, and freeze-dried desserts—except for that nasty ice cream—are greeted with a round of fireside cheers.

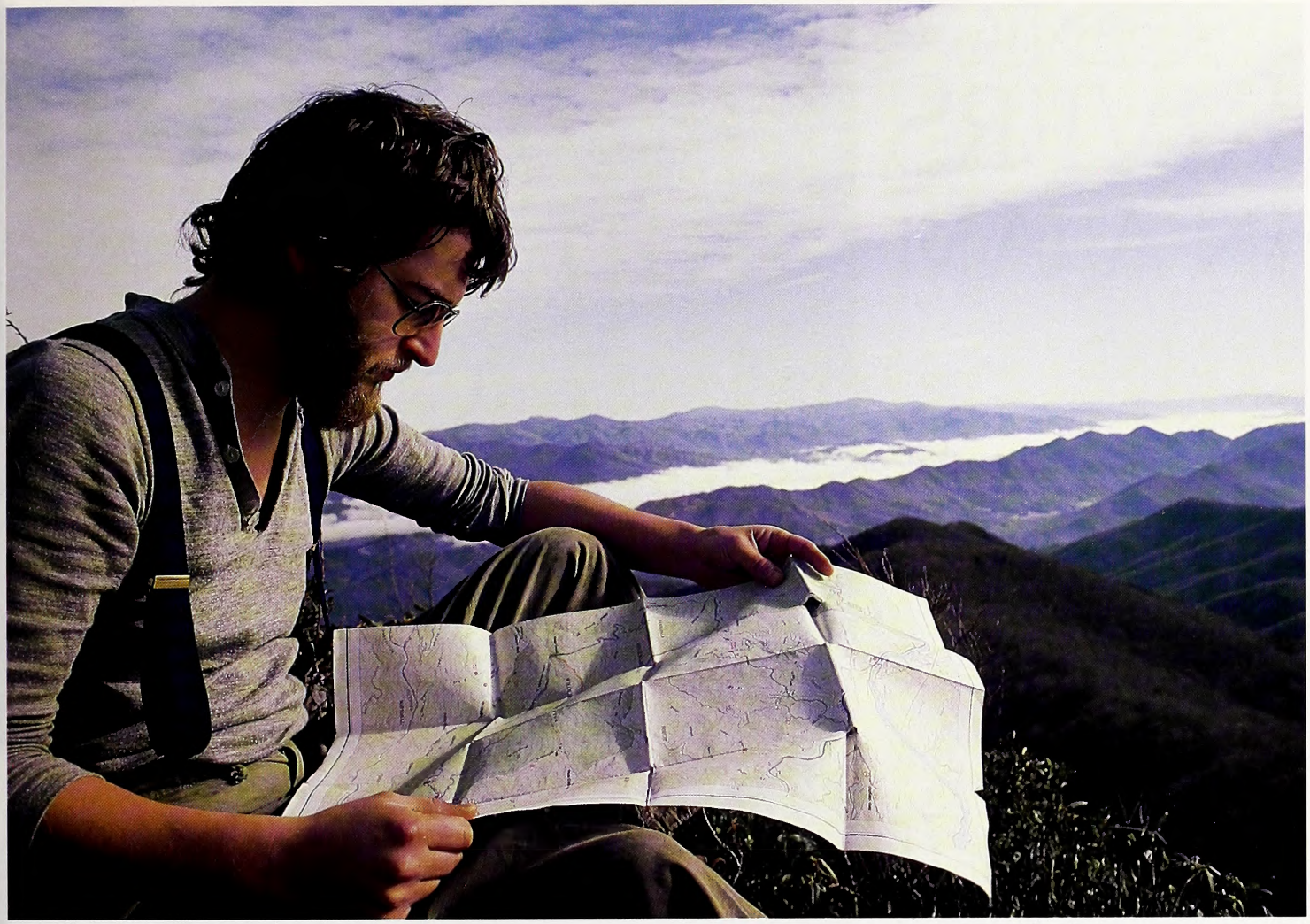
You'll need only basic cookware to prepare this fare. We've purposefully omitted anything that needs to be fried, sauteed or simmered, so we've eliminated the need for a frying pan. One- and two-quart saucepans should suffice for a pair of campers, plus a single lightweight plate and utilitarian utensils. Scrounge around under the stove for the lightest cookware you can find, regardless of its condition. What's that? A battered college-era copper-bottomed pot with no handle? You're in business.

That leaves only water to complete our trilogy of life's necessities. Some of my backpacking buddies will drink any water they can find, mud puddles and worse. Not me. I want it bottled, boiled, blasted through a purification filter or brought straight from the home spigot. I'll drink iodine-treated water if I have to, but even loaded with Kool-Aid it's a vile concoction. In the mountains you can generally count on spring water near most campsites, though you may have to search carefully. Not so in the Piedmont and coastal areas, so plan on packing in what drinking water you'll need. Drinking untreated or unboiled surface water from creeks, or even what may appear to be spring water, is an invitation to *Giardia* and other unwelcome intestinal woes and diseases, so be careful out there.

Now, spread out all your gear on the den floor so we can run through a checklist and pack. The basic rule of loading a backpack is this: keep the center of gravity low, so your hips bear the burden instead of your shoulders. That means heavy, bulky items—stoves, cookware and food—should be loaded directly above the sleeping bag. In my bag, that means the middle cargo pouch. The top main compartment holds clothes, a heavy parka if the season calls for it, Polarguard booties, and more often than not, a jumbo-sized loaf of French bread or bag of bagels, all topped with a lightweight parka where it will be easy to reach during lunch breaks and rest stops.

In the four side pouches I pack the following: 1.5-liter water bottle, flashlight, lighter, candles, compass, trail snacks, moleskin and assorted seasonal niceties such as gloves, gaiters, sunblock or sunglasses. Tent and ground cloth are tucked under the flap.

In the outside flap pocket goes a space



***The first commandment*** *of backpack camping is to carry a quality topographic map. Not only will you be able to orient yourself if lost, but your trip will be more enjoyable when you can identify distant peaks and landmarks, camping spots, water sources and trails.*

blanket, waterproof pack cover and topo maps. Do not go anywhere—I repeat, *anywhere*—without map and compass. I don't mean the Trail Map to the Entire Western Hemisphere either, but the genuine U.S. Geological Survey 7.5-minute topographic maps or equivalent. With a topo in hand you'll be safer, feel more secure, and enjoy your trip much more. You can identify distant peaks, know which side of the mountain to search for springs, find river falls, plot a route to balds for lunch stops and, gee, even be able to find your way back to camp if you get lost.

I pack all my camera gear into a lightweight fanny pack that's fastened around the backpack; that way I can simply pop off the auxiliary pack and scramble off the trail for photos. It's a good idea to pack some sort of lightweight fanny pack or day pack in case you decide to establish a base camp and day hike. Some friends of mine pack all their food and cooking equipment into a single day pack that's stuffed into the backpack.

If you've packed sparingly and chosen your foods wisely, your pack should weigh no more than one-third of your total body weight. (If you're 20 pounds overweight, that doesn't mean you get an additional seven pounds of payload.) Hoist that pack onto your shoulders. Cinch your hip belt down tightly. Tighter. Bounce on your toes a few times. Climb some stairs. Marginally comfortable? Time to hit the trail.

The choice of where to go on an inaugural adventure has far-reaching consequences. A rugged, difficult route will drain enthusiasm; far better to start off with a moderate grade and low mileage. For a rule of heel, consider this: an elevation gain of 1,000 feet per mile will separate the men from the boys, so to speak; double will test the oxygen-intake system of anyone who spends eight hours a day behind a desk. And anything steeper might separate your quadriceps from your femur, or at least feel like it. Best to cut your backpacking teeth on more gentle environs. Steer away away from a coastal debut as well; sand, sun and skeeters will likely conspire against all but the most ardent campers there.

That leaves the Piedmont and foothills regions for your first time out, and there is plenty to choose from in the state's midsection. The Uwharrie National Forest boasts miles of trails that wend among 17 peaks that rise from 300 to 500 feet above the surrounding peneplain—not enough elevation to land you on *Wide World of Sports*, but just enough for a taste of what more rugged terrain would feel like. The trail along Basin Creek on Blue Ridge Parkway land near Stone Mountain is perfect for a one-night introduction to backpacking, as are Stone Mountain State Park's six permit-only, backpack-only campsites situated along Widow's Creek above the East Prong of the Roaring River. Merchants Millpond State Park also offers a backpack-only campsite with gentle access.

Wherever you decide to lay your first backpacking tracks, keep in mind the discipline's three basic tenets: 1) Pack it in, pack it out; 2) camp with minimum impact; and 3) leave some cold drinks on ice in your vehicle, awaiting your return. That's one trick of the backpacking trade you'll *never* outgrow! ☒

# SCENIC RIVERS IN A JAM

## Scores of rivers in North Carolina could be named as state Natural and Scenic rivers, but in 21 years only four have been designated. What's the problem?

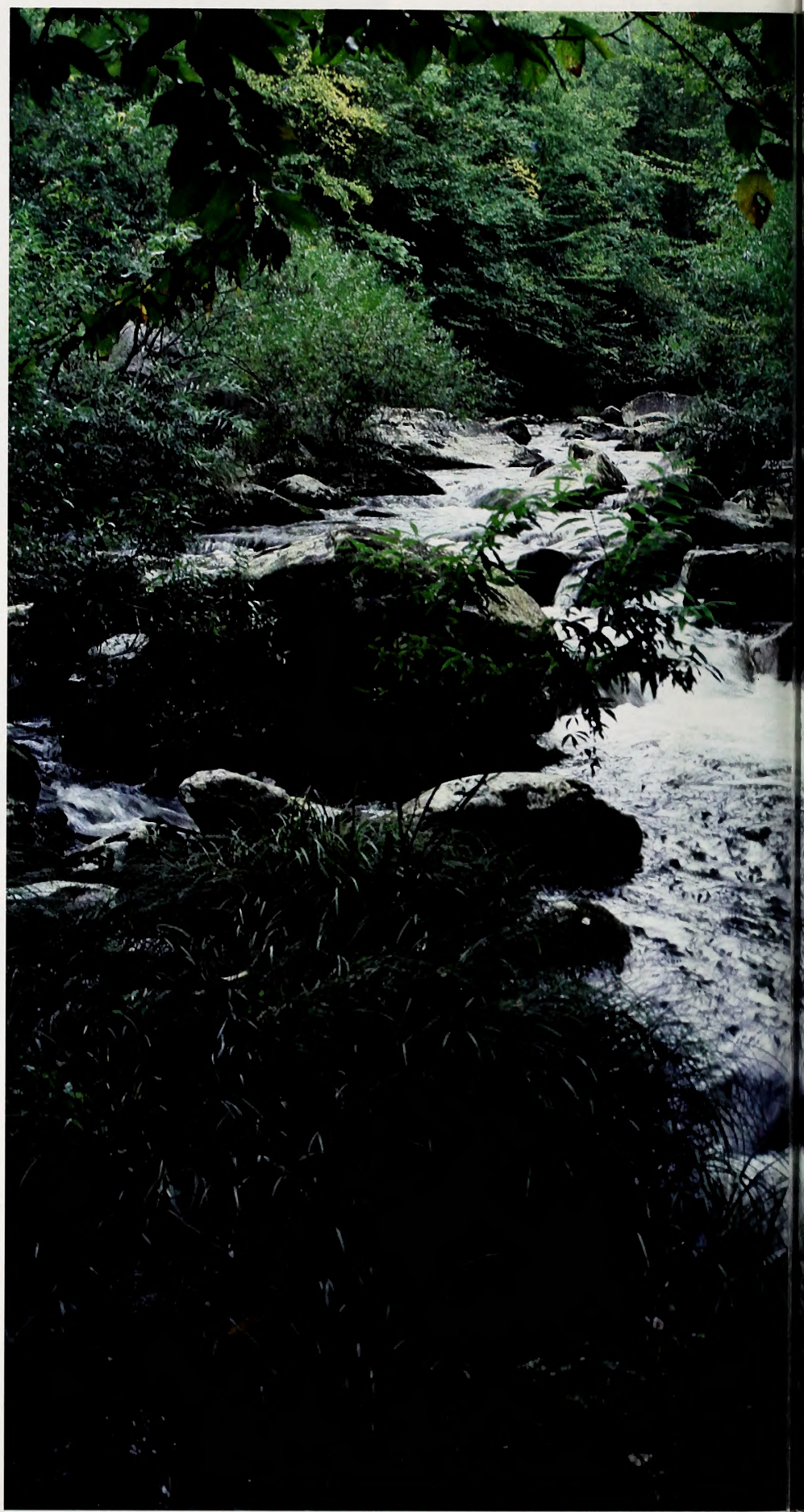
written by John Manuel ©1992
photographed by Ken Taylor

"*Contemporary home overlooking scenic New River. 5 BR, 3½ bath, with whirlpool tubs. Living room with fireplace. Over 1,100 sq. ft. in decks. $199,000.*"

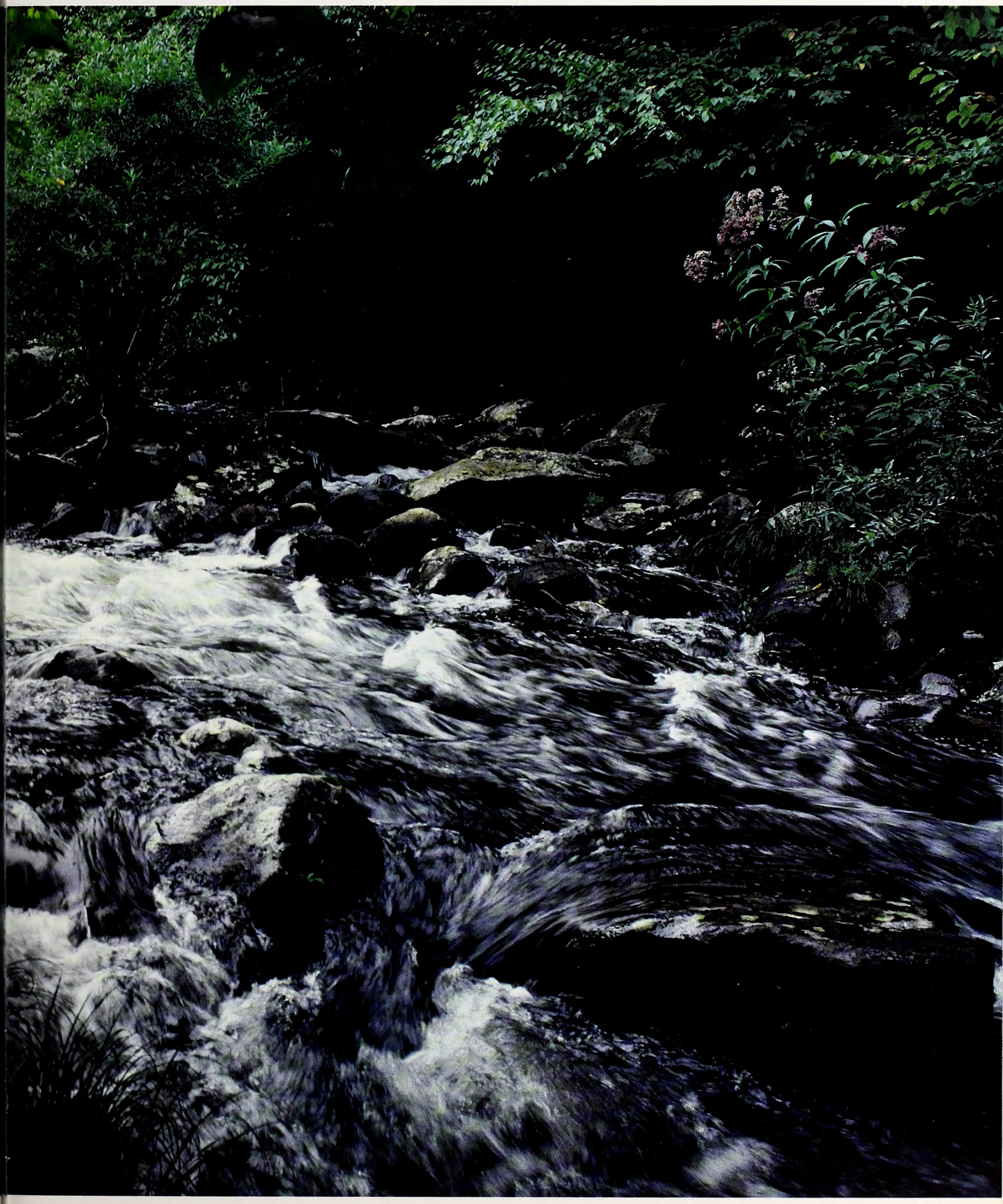
The ad in the real estate section of the *Watauga Democrat* was just one of several for houses along the New River in Ashe County. The rest of the state may be in a real estate slump, but on the New River, sales are going strong.

"Oh, yes, the river is still a big draw," says Phil Lewis, owner of Dogwood Realty in West Jefferson. "I would say about 25 lots per year are being sold along the river—mostly one-acre lots. People want to be able to enjoy the view."

And enjoy it they must. Just as the residents of Sugar Top condominium enjoy the view of Grandfather Mountain, homeowners along the banks of the New River must enjoy looking out on the oldest and one of the most beautiful rivers in the nation. Unfortunately, one man's viewing stand is another man's view. And if you happen to be



***Thirteen miles of the** Linville River have been designated a state Natural and Scenic river. Although the state protection granted by this status is weak, this section of the Linville River has plenty of federal protection since it flows through federally managed lands.*



***The second oldest river** on earth, the New River flows through the rolling countryside of Ashe and Alleghany counties. Twenty-six and a half miles of the New were named a Natural and Scenic river in 1976, but funds for land purchases that would protect the river corridor were not appropriated by the General Assembly until the end of the 1980s.*

seated in a canoe in the middle of the New River, you may be more than a little disappointed to find the banks lined with vacation homes.

Residential development along the New River in Ashe and Alleghany counties is nothing new. It began over 15 years ago when the state and federal governments designated 26½ miles of the waterway in North Carolina as a Natural and Scenic River (the federal designation is Wild and Scenic). The tragedy is that development is still going strong despite, or some would say because of, the attention that the designation gives it. Is the state's Natural and Scenic Rivers Act a worthless piece of legislation? What has it done for or to the various river segments included in the system? To answer this question, we take a close look at the legislation itself, as well as the rivers it was designed to protect.

***The North Carolina*** Natural and Scenic Rivers Act was established in 1971 "to retain the natural and scenic conditions in some of the state's valuable rivers by maintaining them in a free-flowing state, and to protect their water quality and adjacent lands by retaining these natural and scenic conditions."

As originally written, the act defined two classes of river—natural and scenic—as eligible for protection. Sections of rivers designated as "natural" must be free of man-made impoundments and generally inaccessible except by trail. The land within the boundaries must be essentially primitive and the waters unpolluted.

Scenic river segments must also be free of impoundments, and the land within the boundaries largely primitive and undeveloped. However, the river may be accessible in places by roads.

In 1989, a third classification—recreation—was created by the same legislation that designated the Lumber River. Recreational areas must offer outstanding recreation and scenic values and be largely free of impoundments. They may have some development on their shorelines and have more extensive public access than natural or scenic river segments.

To be designated as part of the system, the river segment length must be no less than one mile in length. The water quality must be at least class "C"—next to last in the state's four-grade system. Water flow must be continuous and not subject to withdrawal or regulation to the extent of substantially altering the natural ecology of the stream. Finally, public access must be "limited."

This broad definition leaves no shortage of rivers in North Carolina that could be eligible for designation as Natural and Scenic. In a 1975 survey coordinated by the N.C. Division of Parks and Recreation, the public

***These few residences*** *enjoy an enviable view of the New River. In some spots along the Natural and Scenic portion of the New, the river is lined with vacation homes. Since 1989, the state has allocated $2.5 million for corridor protection, and 1,090 acres of river frontage have been protected.*

identified 110 rivers for consideration under the act. Kim Huband, program administrator for Parks and Recreation, says that from a technical standpoint, sections of most of these rivers could qualify for the Natural and Scenic designation. Unfortunately, politics and economics have made this nothing more than a wish list.

Since the act was passed in 1971, dozens of rivers have been studied for Natural and Scenic designations. Only 11 have made it to the public-meeting stage, and seven of these —the Green, Jacob Fork, Uwharrie, South, Waccamaw, Black and Bennetts Creek— were dropped from consideration due to public opposition expressed at the hearings.

"A lot of people came to the public meetings thinking that natural and scenic river designation would mean that the state was going to take their land or affect their property rights," says Huband. "But those fears were largely unfounded. First of all, the state program is nonregulatory and private property rights are not affected by designation. Designation simply allows the state to protect the river corridor through the purchase of land or the purchase of an interest in land. And because there's been so little money set aside for purchase, even that is unlikely to happen."

The net result is that segments of only four rivers have been included in the Natural and Scenic Rivers system—26½ miles of the New River, 13 miles of the Linville River, 4½ miles of the Horsepasture River, and 102 miles of the Lumber River. And what the citizens of North Carolina have received as a result of these designations is of dubious worth.

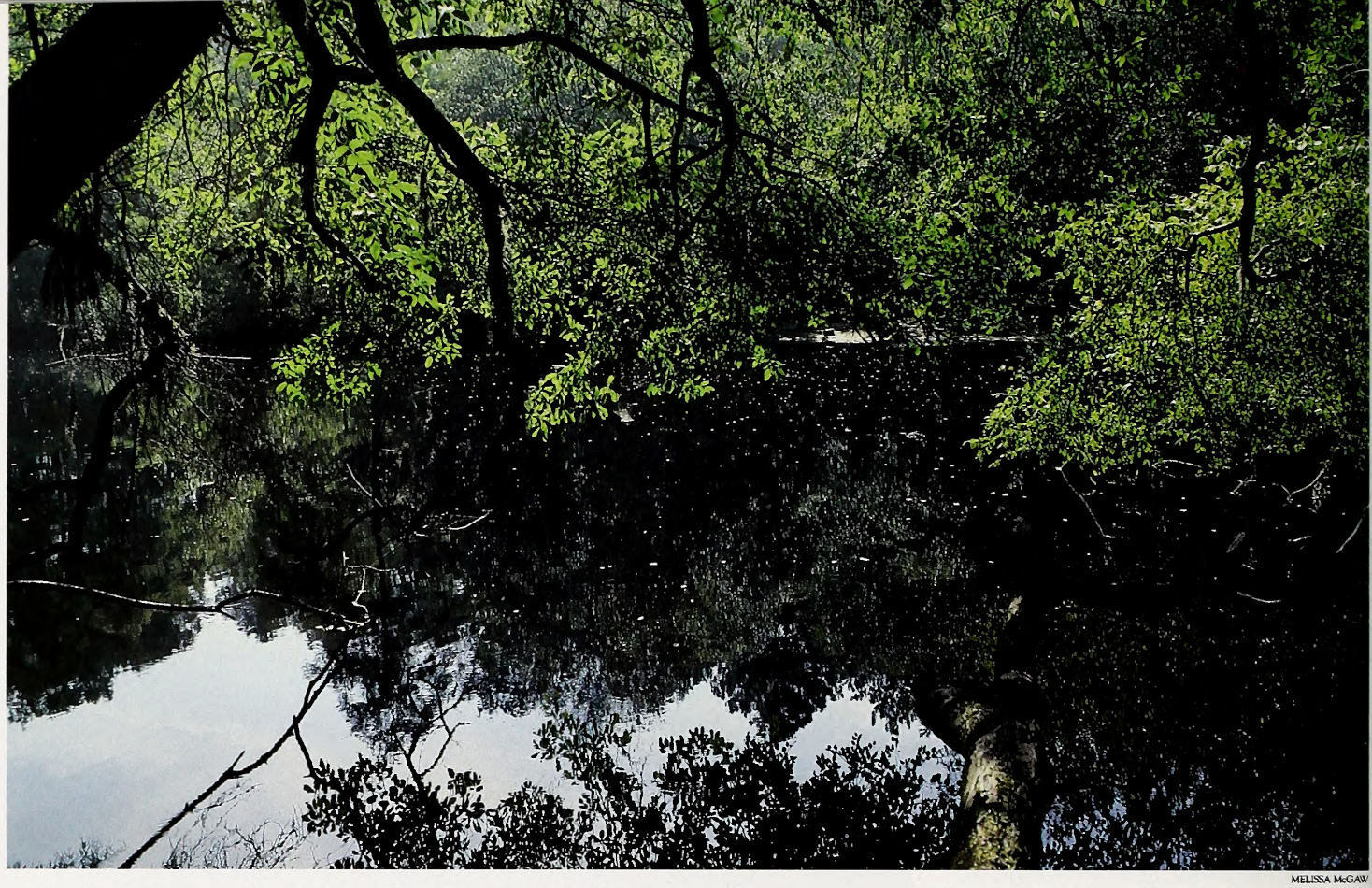
***To understand why,*** it's important to understand exactly what the designation does. The Natural and Scenic Rivers Act protects designated river segments in three ways. First, it prohibits any "project works"— dams, reservoirs, water conduits and transmission lines—that would have adverse effects on the natural and scenic qualities of a river. Second, the act "permits" acquisition of riparian lands through outright purchase or through the acquisition of conservation easements. Finally, it promotes management activities by the N.C. Division of Parks and Recreation to further the purposes of the act.

As actually practiced, however, the type and amount of protection offered by the state hasn't amounted to much. For example, the natural and scenic section of the Linville River flows through Linville Gorge—a federally designated wilderness area. The land on either side is owned and managed by the National Park Service and the U.S. Forest Service, so giving it state protection under the Natural and Scenic Rivers Act was purely a token gesture.

On the Horsepasture River in Transylvania County the situation is similar. The land through which the designated section flows is owned either by the U.S. Forest Service or Duke Power. According to Bill Thomas, president of the Friends of the Horsepasture, Duke has been an excellent land steward and has expressed no desire to develop its property along the river. But in one very important respect, the natural and scenic river designation did save the Horsepasture from a potentially tragic development.

In 1983, Carrasan Power Company, a California-based investment team, purchased land along the Horsepasture in hopes of constructing a hydroelectric facility. The project would have greatly reduced the water flow over a series of highly scenic waterfalls just downstream from N.C. 281. Concerned citizenry formed the Friends of the Horsepasture and petitioned the state to include the 4½-mile stretch in their natural and scenic river system. That designation was granted in 1985. At the same time, U.S. Rep. Jamie Clark petitioned the federal government to include it in their Wild and Scenic Rivers system. Federal designation was granted in 1986.

Thomas says by the time the river received



MELISSA McGAW

*In 1989, the Lumber River was the last of four rivers to receive Natural and Scenic status. A 102-mile portion flowing through Scotland, Hoke, Robeson and Columbus counties received the designation. The pretty blackwater stream meanders south into South Carolina.*

state designation, Carrasan was already negotiating to bail out of the project because the economics no longer looked attractive. However, he does feel the state designation served a useful purpose.

"Getting the river designated by the state helped in getting federal designation," he says. "That's important because legally a federal agency could override the state if, for example, it wanted to put a dam on the river. With both the state and federal designation, you're not going to see any dams on that part of the river."

Beyond the designation, however, neither the state nor the federal governments has invested any money in the Horsepasture. The U.S. Forest Service has been negotiating with Duke Power for years to buy or trade their stream-side acreage to put in parking and restroom facilities. So far, they have had no success. Meanwhile, crowds of up to 100 people hike and swim along this short section of river on summer days. Stream-side trails are getting worn, but no money has been appropriated for signs or trail maintenance.

"Unless or until we can put in those facilities, we don't want to encourage much more use of the river," says Melinda McWilliams of the Forest Service.

***The one river for which*** the state has appropriated funds is the New River. Unlike the Horsepasture where a federal agency has taken responsibility for managing the designated segment, management of the New River has been left entirely to the state. In 1977, Parks and Recreation identified $2 million in land purchases and $4.5 million in capital improvements needed for the corridor. The funds were never appropriated by the General Assembly.

Meanwhile, developers drew a bead on the New River corridor. A major subdivision was planned near the confluence of the North and South forks of the New, and smaller subdivisions were begun elsewhere along the river. Faced with public outcry over the development of a "protected" river corridor, the Parks and Recreation allocated $2 million for land purchases along the New in 1989. Most of that money went to buy the 350 acres on which the major subdivision was underway (see "Old River, New Problems," August 1990).

As of January 1992, the state had spent $2.5 million for the New River and brought a total of 1,090 acres under protection. By law, the state is limited to acquiring 2,200 acres along the New River. The visual corridor of the designated stretch of the river is estimated to include 14,000 acres. Thus, even if funds were available for acquisition, the state could only protect one-seventh of the river corridor by this method.

"Land acquisition can be a component of a river-protection plan, but clearly it can't be the only one," says Sue Regier, resource management specialist with Parks and Recreation.

Early on, a great deal of hope was placed in conservation easements as a way of protecting the land without acquiring it in fee simple. Landowners could sell or donate the development rights to their land in exchange for a lower tax valuation. However, time has shown that conservation easements are often not the bargain they were made out to be.

"With a conservation easement, you are making a long-term commitment to work with a landowner or series of landowners," says Regier. "You end up investing a lot of staff time working with landowners instead of managing the land."

The lack of state funds for the protection of designated rivers has been further evidenced on the Lumber River, the fourth and latest river to be included in the state system. After a decade of grassroot efforts, 102 miles of the Lumber in Hoke, Scotland, Robeson, and Columbus counties were designated as the Lumber River State Park and State River in 1989. The bill introduced

to create the park requested $3 million for planning, development and operations. As ultimately passed, the bill appropriated no monies. Fortunately, Parks and Recreation has since received two grants from the state Recreation and Natural Heritage Trust Fund totaling almost $375,000. That money has been used to purchase 500 acres along the river, with another 86 acres currently under negotiation.

***In a 1990 report*** titled *An Assessment of the North Carolina Natural and Scenic Rivers System*, the Division of Parks and Recreation acknowledged that the state program is in desperate need of repair. "The 19-year-old North Carolina Natural and Scenic Rivers System has clearly failed to achieve its purpose of preserving and protecting outstanding state rivers," the report begins. "The system consists of only four rivers, and most of these river miles remain largely unprotected. Resources to support the system have been and continue to be minimal, virtually guaranteeing failure of a system which relies primarily on land acquisition for river corridor protection."

The report makes a host of recommendations for improving the Natural and Scenic Rivers system. Foremost among these is the need to appropriate funds to protect lands adequately along the existing rivers in the system. The report further recommends that any additions to the system come with "adequate authorization and appropriation for land acquisition, development, and operations"—language taken directly from the State Parks Act.

Given the fate of riparian lands along designated rivers such as the New, additional funds are clearly needed to make the state's scenic rivers program a meaningful one. Just as clearly, such funds will be hard to come by in this era of unprecedented state budget deficits. The citizens of North Carolina will have to decide how important an effective system is to them and advise their legislators to act accordingly.

The report also recommends that the act be amended to include provisions that encourage or otherwise pressure local governments to adopt land-use controls to protect the river corridors. To date, the voluntary approach has not produced any meaningful results. Local governments along the New River have steadfastly refused to adopt restrictive zoning in spite of the state's requests. Therefore, a provision that allows the state to enact appropriate zoning if the local governments fail to do so (as done with the Coastal Area Management Act) would seem to be a necessity, especially if increased funding for land acquisition is not forthcoming.

Although some people might view the report's recommendations as unrealistic or heavy-handed, such regulations are not without precedent in other states. Michigan has a scenic rivers act that relies on local zoning ordinances, backed up by the threat of state-imposed zoning, to protect its designated rivers. Oregon has a law that establishes rules of land management for different categories of rivers. Should a landowner want to pursue a development that is in violation of these rules, he or she must notify the state in writing. The state will then proceed to try to work out a mutually agreeable compromise. If that fails, the state must either step aside or, as a last resort, exercise its power of eminent domain—a step that is reportedly not often needed.

Kentucky's "wild rivers" system prohibits development within 2,000 feet from the center of a designated river. Landowners may apply for permits to conduct select timber cutting, resource removal or agricultural use within those boundaries. Massachusetts encourages local governments to protect designated river corridors through land-use planning. Where local governments have adopted open-space plans, they become eligible for 50 percent reimbursement of acquisition costs for land along river corridors.

"The better state programs seem to combine the ability to purchase land with encouragements for local government to adopt protective zoning," says Huband.

***In 1990,*** N.C. Sen. J.K. Sherron, D-Wake, and the State Parks and Recreation Areas Study Commission attempted to put some teeth into the Natural and Scenic Rivers Act. A bill was drafted that would have amended the act by requiring local governments to adopt protective land-use plans within two years of a river being designated under the system. If local governments failed to enact such controls, the designation would be taken away. Some legislators objected to the state forcing local governments to regulate natural and scenic river corridors, and compromises made by legislative committees weakened the bill. Even in its watered-down version, the bill was defeated. The vote was close, however, and there is a possibility that the bill will be revived.

No money, no teeth—what, then, is accomplished by designating a river as Natural and Scenic? For one, the act does restrict the construction of "project works" along designated rivers. That has helped to preserve the New and the Horsepasture rivers in their free-flowing state. Some, albeit relatively little, land has been acquired and protected along the New and Lumber rivers, and some conservation easements have been procured. State staff time and expertise have been made available for the development of master plans.

***Although no acquisition funds*** *were provided by the state to protect the Lumber, some money for land purchase was later granted to the Division of Parks and Recreation by the Natural Heritage Trust Fund. And local fund-raising efforts, triggered by a corporate challenge grant, have raised more money.*

And the Natural and Scenic designation has served as a focal point for local fund-raising efforts. In 1991, Carolina Power & Light Co. offered a $40,000 challenge grant to help fund the development of a master plan for the Lumber River State Park. The Lumber River Citizens Advisory Committee met that challenge by raising $43,343. In addition, the Office of Parks, Recreation and Tourism Management at North Carolina State University has offered to contribute $31,692 of in-kind services. The master plan will be developed by NCSU in conjunction with scientists at other area universities, such as Pembroke State University, and Parks and Recreation's planning staff.

In the end, the Natural and Scenic Rivers Act alone may never be able to prevent undesirable development along any river in the state. But the designation is an acknowledgement of how much these rivers mean to the people of North Carolina. And if the local citizenry really want to protect a river, local government zoning powers offer a means. Citizens may also look to the state for advice and, perhaps, some staff time and financial assistance. There is also the possibility that the General Assembly may appropriate adequate funds or require land-use controls for designated rivers.

In an era of budget deficits and a burgeoning property-rights movement, that may be too much to hope for. ☒

# Bass Fishing at Zero Range

If you want to catch bass consistently in thick cover, you've got to get in close. Here's how.

written and photographed by Joel Arrington ©1992

In our fishing dreams, we picture ourselves in a well-appointed boat in a beautiful cove. Clear water floods the greening willows and emergent bushes while puffy white clouds drift across a blue sky. From a low tree a raspy-voiced blackbird sings, and on every log turtles bask in the warm spring sunshine. We take aim and fire a lobbing cast far across the calm water to plop inches from a half-submerged log. No backlash, of course. We work a surface plug enticingly in this reverie and a big fish swirls on it in violence and white water. We set up hard, the fish jumps clear of the cover and we slug it out in the cove's open depths with the outcome much in doubt. Finally, grasping the bass' lower jaw, we remove the hooks and release the fish with a rich sense of accomplishment.

Bass fishing reality, however, seldom matches our dreams. What we are much more likely to encounter is wind, dingy water and the bass in cover so dense that you can't work a lure more than a few inches before it's got to be retrieved and cast somewhere else. Success comes to practical anglers who have learned to do what has to be done to fish bass out of what the less experienced and dedicated would regard as impossible cover.

While long casts are much to be admired, and are useful at times, the template for success we should carry in our heads is one based on near vertical, close-range fishing. We should get on top of bass and fish a short line. We need to think of bass fishing as something we do most often at zero range with short, accurate casts. That's especially true in the spring, but also in other seasons when we're fishing heavy cover in relatively shallow, murky water.

Jackie Turbeville, a fishing professional from Collierville, Tenn., and a lure company representative, was one of the fine anglers who showed me how to fish the short cast. Jackie is a natural fisherman. By that I mean he knows intuitively, through exercise of a rare gift over a lifetime on the water, what is required. Without a sense of competition, for example, he hits five pieces of cover to my one, changing and presenting three different lures to my one. He moves quickly over the boat, the decisions coming fast, without hesitation, taking action immediately. Moving into a cover, he shuts down the engine, springs forward, drops the trolling motor and has a lure in the water before I can pick up a rod. He remembers every bush, it seems, certainly every spot where he got a strike or hooked a fish this morning or last week—even in years past. Returning to one of these locations an hour or a year later, he can recall exactly what happened. He notes every small fishing condition, even things as seemingly insignificant as a minor variation in water clarity in one part of the cove. This information he files away somewhere for future use. He is always looking for some sense or reason to the fishing, looking for what fishermen call a pattern.

***A pattern is predictable*** fish behavior that applies to a substantial part of the population. If bass are in lee coves on hard structure in 4 to 6 feet of water, for example, most of them will be in similar locations around the lake—for a while at least. Bass are unlikely then to be in shallow grass beds of windward coves in a foot of water, for example, and the seasoned angler will not waste his time casting there.

One of the most common spring patterns brings spawning bass to heavy cover in the shallows. Often the water is gray-brown from recent rains, a condition that gives the fish confidence to go shallow. You may not be able to see a lure 4 inches beneath the surface, but a bass can find it instantly if the lure is dropped close beside it. Whether the fish strikes out of anger against an intruder into its territory or bedding location, or out of hunger, the result for the angler is the same.

Jackie and I hit this pattern one morning. Typically high water flooded willows and brush on islands that had been dry a few weeks earlier. Gusty winds made it hard to control the boat and to cast accurately from a distance, but the cover was alluring.

"Some of these places look so good," Jackie said, "they'll make your heart stop to pull a lure through them."

We fished spinnerbaits and soft plastic craws and lizards. As we approached cover, Jackie would make one cast from far out—say 20 feet. If there were no takers, the trolling motor would pull the boat closer to the cover, finally too close for a conventional overhand cast. Jackie stood in the bow and pointed his rod down, casting low, flat trajectories underhanded through and beneath the willow bushes, one cast after another probing the most likely holding locations. Finally we actually got into the willow trees, pulling the boat and ourselves hand over hand, deeper and deeper into the jungle as far as the boat would float. His casts were accurate and fearless. Rarely, however, did he hang up. The spinnerbaits and rubber salamaders and worms he used were relatively snagless to

***This Currituck Sound** guide has moved in close to the duck blind so that the fisherman can reach all the likely spots. Fishing close to cover is often a deadly tactic for largemouth bass in relatively shallow water when slightly dingy water or wind ripples help hide the fisherman.*

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begin with, and he cast well. He also knew how to free a lure that had simply stuck or wrapped a turn or two. Only rarely did he have to pull the boat to his lure and free the hook. Even then, he cast immediately very close by, using that opportunity to reach a spot he might have passed up.

No doubt some bass were spooked by the commotion, but many were not. I know, because we caught them. Well, Jackie caught most of them, but, following his example, I was able to snake a few 3- to 4-pounders, too, from the heavy cover despite my still developing skills and position at the back of the boat.

Close-range fishing is especially effective with the flippin' technique.

If you've ever fished with a short cane pole, you have the feel for flippin', a method of working a relatively heavy lure close, but possibly deep as well. It's done with a casting rod a little longer and a little stiffer than usual, and often with a longer butt. A pistol-grip casting rod or even a spin rod can be used for flippin', but specialists like a 7-foot plug rod, stout to the tip, with a 12- to 14-inch butt. The extra rod length gives an advantage in casting and permits reaching locations considerably beyond the tip. The extra butt length can lie along the forearm for leverage when working lures and especially when hauling hard on a fish. Manufacturers have come up with two-piece and telescoping flippin' rods for greater convenience in transport.

The lure needs weight. You can fish a "jig-and-pig," which is a weedless lead-head jig tipped with a strip of pork rind or with a plastic trailer, but it should weigh ¼ ounce to perhaps 2 ounces at the extreme. You can fish a weedless plastic worm and vary the size of the sliding bullet lead, but be careful not to go too light—⅜- and ½-ounce weights are commonplace in flippin'.

Line should be substantial, too. Most experienced anglers use 20- to 30-pound test, and often brands of line that are especially thin for their test. It is a mistake, in my opinion, to try to fish line under 15-pound test in heavy cover. Clear mountain lakes could be an exception.

With balanced rod, line and lure weight, the right-handed angler drops the lure down a rod-length off the tip and pulls an arm-length of line off the revolving-spool reel with the left hand. Swinging the dangling lure like a pendulum, he feeds line in his left hand to project the lure toward its target. A steep bank can be fished by paying out line as the lure hops down the incline back toward the boat. You control the lure descent with your thumb on the spool and make the jig or worm hop by gently working the rod tip.

***A pig 'n jig type lure** is a good choice for anglers using short, accurate casts, especially in spring when the bass are in the shallows around cover. They also work great fished nearly vertically in deeper cover. Such lures are relatively weedless, and their effectiveness is improved by adding a pork chunk trailer, or a soft plastic crawdad or curly-tailed worm.*

***Bass love willows** and other flooded vegetation along the shorelines until hot weather forces them into the depths. If the water isn't too clear, it's best to get in close and make lots of short casts to work all the pockets. Fishing close with heavier line also gives the angler a better chance of hoisting a lunker out of thick cover.*

Just as often, you will want to drop a lure on one close piece of cover, and then another, mostly working within 15 feet of the boat. Any spot that can possibly hold a fish should be probed. Avoid reaching too far and risking a hang-up that will require you to run the boat in, spooking bass from cover you might have fished. Rather, take the boat to the fish.

A revolving-spool reel must be in proper adjustment to handle these kinds of short casts. Modern reels are great improvements over backlash-prone models some of us grew up with. Incessant practice doesn't hurt, either.

The most important moment is the instant the lure hits the water. More strikes come then than at any other time. The angler must learn to strike reflexively and very hard right away, and I can tell you from personal experience that it takes a conscious act of will to learn to be always ready at that moment. I have lost several fish when they struck and I didn't. Rather, I was about a half-second late. Other times, the lure may plop in and just lie there. What the angler doesn't know is that a bass could very well be "standing straddle of it," as guide Bud Lupton at Currituck once said, "waiting for it to move." So the usual routine for flippin' in shallow water is to drop the lure and if no strike comes after a couple of seconds, twitch it gently or move it a few inches. Then pick it up for the next shot. It will be a waste of time to leave the lure any longer. This fishing can occur in water so shallow it will hardly cover a bass, and so dirty that you can't see the fish. More important, the fish can't see you.

Hugh Harvell, an expert on this type of fishing, makes soft plastic baits for some of the country's best-known lure manufacturers. On a cool, cloudy, windy day, he took me to school on flippin'. I was amazed at how close he would get over cover, dropping a pumpkinseed green, metal-flake crawfish vertically on one stick-up after another. I was especially impressed with how thoroughly and quickly he covered a broad swath of cover, and with his persistence. On pre-spawning fish that were back in the shallows just staking out bedding locations, he caught eight bass under 2½ pounds while I could manage only half that many, fishing hard by my standards.

Harvell wins tournaments partly because he fishes like he's killing snakes and partly because he doesn't quit until the last whistle, but the main reason is that he, like Jackie Turbeville, is a master of the short, accurate cast. ☒

# It's Slimy! It's Alive!

Is it an animal? If it is, it's one form of wildlife that most people don't recognize, or avoid if they do. Say hello to slime molds.

written and photographed
by Harry Ellis ©1992

My introduction to the strange world of slime molds—also called myxomycetes and mycetozoa—came many years ago when, on one of my woodland outings, I happened upon an old rotting stump beside a little stream that tumbled down through a mossy glen. Spreading over the surface of the loose bark were hundreds of closely crowded fungi—like growths resembling tiny toy balloons, each no more than one-eighth of an inch in height. Of a deep orange color, they hung from the surface by thin fragile stalks. Under my pocket magnifying lens, a new world of beauty and intricate detail came alive. I had found the fruiting state of the slime mold *Leocarpus fragilis*, a common species in damp, shady woodlands.

I later learned that there are two distinct phases in the life history of slime molds—an animal-like stage called the plasmodium that may last for several weeks, and a plant-like spore-producing stage. As a plasmodium, it is a great, moving, pulsating sheet or blob of protoplasm that behaves like a giant amoeba. This oddest of all living things propels itself through the forest, under moist fallen leaves, under wet logs, over them, and through them, with the speed of a clock's hour hand, or as much as 45 inches in an hour. It moves by a process known as "protoplasmic streaming," a series of contractions and expansions, growing in size as it moves and feeds until it is sometimes several feet across. Like an eerie creature from the pages of a science-fiction magazine, it has no clearly defined physical form and no symmetry or plan that can be detected. It contains no confining cell walls but thousands of nuclei. If you touch its slippery surface, you are rewarded by a cold, weird and unpleasant sensation.

The plasmodium in most species is colorless or translucent, somewhat like the white of an egg. But some are pigmented in various colors, such as the bright red plasmodium of *Lycogala epidendrum*. In this amoeba-like state, slime molds live 90 percent of their lives, feeding and moving about, always staying in the dark shadows or traveling at night. They surround, engulf and digest solid organic particles of food in a way that is totally unlike any plant, though very similar to primitive forms of animal life. Considered in this state, slime molds would appear, without question, to belong to the animal kingdom.

But wait! Eventually the animal phase of its existence comes to an end, its travels over. Triggered by a mysterious inner clock, it leaves the dark shadows and creeps upward

***The fruiting bodies** of a slime mold,* Leocarpus fragilis, *look like miniature toy balloons, none of them more than one eighth of an inch long. Here they cover a rotting stump. Slime molds have two stages—an animal-like form called the plasmodium, and a plant-like stage that produces spores.*

***Species of slime molds** differ in color and form. Growing on a tree trunk, this yellow slime mold* (Fuligo septica) *once caused a panic when people found their backyard trees covered with the alien-looking forms. Though tiny, the fruiting bodies of slime molds grow in colorful colonies, thus calling attention to themselves.*

into the bright light, ascending to the upper surface of a log or perhaps up the side of a stump. The time has arrived for the creature to reproduce its kind. Now the mass becomes drier and wholly stationary. With no further power of movement, it loses its jelly-like appearance and within hours begins sending up spore stalks and producing the particular kind of sporangia (spore cases) characteristic of its species, just as a fungus would do. This is the stage in which we most commonly see them. Now plant-like in every way, it would seem to belong to the plant kingdom!

With some exceptions, the fruiting bodies of myxomycetes are so minute as to place them in a Lilliputian world of their own. Most are no more than a quarter of an inch high, some much less. Their habit, however, of grouping into dense colonies often catches the eye and calls attention to their presence. Under the lens we find them as brightly colored as flowers and as exquisitely fashioned as ferns and snowflakes. They appear in almost every tint of the rainbow and in a variety of shapes. Some resemble tiny balls, toy balloons or flowers; others look like cattail plants, lollipops or almost any other object. Many are extremely beautiful and all are evidence of the artistic aspects of nature.

In some slime molds, instead of grouped colonies of sporangia, the fruiting structure consists of a flat, netted surface known as a *plasmodiocarp*. In others, the fruiting arrangement, known as an *aethalium*, may resemble a cushion or lump of dough. Some of these may grow frighteningly large in size.

In the unusually wet summer of 1973, for example, many people in the mountains found their lawns and backyard tree trunks covered with large, eerie-looking, doughy blobs. The panic-stricken residents began to blame the unusual masses on invaders from outer space, especially after the incident received national newspaper coverage. The panic ended only after a biologist correctly identified the bright-yellow lumps as *Fuligo septica*, one of our largest and most common slime molds.

You'd think that such curious organisms would be found only in faraway places, like the jungles of New Guinea or the rain forests of the Amazon. The truth is that many different kinds of myxomycetes are abundant in woodlands all around us. Of the 500 or so species known to science, at least 350 are found in North America. They are especially plentiful in the damp, humid forests and fog-shrouded valleys of the Blue Ridge and Great Smoky Mountains, where the woodland debris has accumulated over long periods of time and there are large numbers of rotting logs.

***One of our most beautiful slime molds,*** Lycogala epidendrum *here grows on a lichen-covered log. This species varies in color from pink to dark brown. Only a few of our most common slime molds have been given common names.*

For almost 200 years, biologists have debated whether slime molds are plants or animals. Calling them plants are botanists and mycologists (students of mushrooms and other fungi) who have named them *myxomycetes*, or "slime fungi." Zoologists also claim them for their own and call them *mycetozoa*, or "fungus animals." The question is still far from resolved, but because mycologists were the first to study them intensively and to describe them in scientific literature, slime molds have come under the International Code of Botanical Nomenclature, and the name "myxomycetes" is the one that is most often used.

After my introduction to slime molds (the "toy balloons" on the stump), I encountered another species several weeks later when I stopped at a cold mountain spring that gushed from under the roots of a poplar tree. On the end of a log lying near the spring, I noticed several tufts of what looked like stiff brown hair or bristles, about a half inch high. It was the sporangial or fruiting stage of *Stemonitis splendens*, one of our best known slime molds. Under magnification, I could see that each dime-sized tuft was made up of dozens of closely crowded individuals that resembled masses of miniature cattail plants. Close by, on the log, was a silvery-white patch of the plasmodium, the last trace of a much larger sheet that had already changed to fruiting bodies. At the 1933 Chicago World's Fair, *Stemonitis* was displayed in the "Believe It Or Not" exhibit as "Hair Growing On Wood—Believe It Or Not." Of course, people who were familiar with slime molds did *not* believe it.

When I touched one of the tufts, a little spore cloud arose and spiraled like smoke on the faint breeze. The spores, upon finding a favorable substratum and the presence of water, germinate into microscopic amoeboid bodies which zoologists regard as protozoa. They move with whip-like tails, feed and multiply by division, each bearing a jelly-like speck of protoplasm. Ultimately millions of them fuse into a great rhythmic sheet—the plasmodium.

"Happy is the man who has learned the meanings of things," wrote the Roman poet, Virgil, 2,000 years ago. Many of the things I see almost daily I do *not* understand, and I often feel that my ignorance is boundless. But there is real pleasure in observing and puzzling over them—like the *Stemonitis* clusters on the log before me. Contemplating the mystery of slime molds, I could not help feeling that here on a rotting log was at least a part of the great mystery of life. In a certain way, these strange organisms are as much a wonder as stars and sunsets, rainbows and migrating birds. Here was an almost incredible form of life, living astride the dividing line that separates plant and animal life, where all our logic of classification dissolves into ghosts and shadows.

To locate the various species of slime molds requires but a bending down to examine the surface of rotting logs, fallen branches and forest debris. If you look carefully, it is often surprising how many species you can find in a single woodland. Usually we walk the outdoors much too swiftly to see the smaller objects around us. To observe these things, the best pace is often the pace of a snail. Strollers, hikers and even experienced outdoorsmen seldom stop to explore the teeming life beneath their feet.

***A common species*** in almost every woodland is *Ceratiomyxa fruticulosa*, called coral slime mold because of its coral shape. On rotting wood, the colorless, translucent plasmodium produces spreading colonies of fruiting bodies, pure white in color, and about one-thirty second of an inch in height. There is much variation in the species, and different forms occur. Some are irregularly branched, others erect like icicles. This myxomycete, unlike all others, produces its spores externally on the ends of individual branches.

One of our most attractive forms is *Lycogala epidendrum*. Worldwide in distribution, it is said to be the most abundant slime mold in the world. From a bright red plasmodium, it produces clusters of rounded cushions or balls, one-eighth to one-quarter of an inch high, and varying in color from a delicate coral-pink to dark brown. Because the sporangia exude a pinkish liquid, it is sometimes called the "Wolf's Milk" slime mold.

Perhaps the most colorful of all our species is the red raspberry slime mold (*Tubifera ferruginosa*). The bright red, spike shaped sporangia are so closely crowded that the compressed clusters resemble ripe, red raspberries and add a touch of color to old rotting logs.

***Under magnification,*** *this cluster of spore stalks, half an inch high, rises from the plasmodium stage of the* Stemonitis splendens. *These fruiting bodies resemble dancing cattail plants. The unpleasant name "slime mold" may be inappropriate because it refers only to the amoeba-like plasmodium, rather than to the plant-like fruiting stage.*

***The animal-like plasmodium*** *stage of this slime mold advances over a log. The fast-moving plasmodium can move as much as 45 inches in an hour. Few ever see the plasmodium stage, since it lives in darkness and shadows.*

These are only a few of the many species one is likely to find. There are many others, including the tapioca slime mold (*Bredfeldia maxima*) with large whitish masses that resemble blobs of tapioca pudding. Then there is the strange-looking serpent slime mold (*Hemitricha serpula*) with a winding, snake-like form. Another colorful species is *Enteridium rozeanum*. It forms large, rounded, cushion-shaped aethalia of a deep pink color on damp, often moss-covered, logs.

Though it has always been my contention that all life is a purpose in itself—of growing and surviving and reproducing—someone always ultimately asks, "What good is it?" As to slime molds, scientists are beginning to find answers. These mysterious masses are being increasingly employed in the laboratory to study basic life processes and the riddle of protoplasm itself, this wondrous "stuff of life." And the species being used almost exclusively is *Physarum polycephalum*. In our forests, it spreads its large bright-yellow plasmodiocarps over wet logs and damp leaves. Unlike most other myxomycetes, it can be easily grown in laboratories in the large quantities needed for biological research.

Cancer researchers are currently studying cell differentiation in myxomycetes to determine exactly what triggers the radical shift from the amoeba-like plasmodial phase to the fungus-like stage of spore production, and whether light plays a dominant role in this transformation. These scientists have discovered that certain genes that are needed for spore production switch on, while those needed only for plasmodial growth switch off. They are wondering if a similar switch-on, switch-off process occurs in the Jekyll-and-Hyde reversal of a normal cell to a wildly malignant one. It is believed that it might work the same in both cases. Thus by studying this process of cell differentiation in the myxomycetes, perhaps a valuable clue can be found in our long battle against a deadly disease.

The question remains, "What *is* a slime mold?" Is it an animal or is it a plant? Is is half animal, half plant? Is it an animal at one stage of its existence, a plant at another? Or is it neither plant nor animal, as an increasing number of biologists are coming to believe? Some suggest that perplexing organisms deserve a special and unique ranking of their own, that in addition to the animal kingdom and the plant kingdom, another should be set aside—the kingdom of the myxomycetes. ☒

*Threat to Water Supplies, Aquatic Ecosystems*

# Zebra Mussel Poised to Invade North Carolina Waters

*Written and Edited by Vic Venters*

Like sailors before a storm, aquatic biologists in North Carolina and the Southeast are bracing for an impending threat —the zebra mussel. This mussel is an exotic mollusk species from Europe that hitchhiked across the Atlantic in the bilges of ships. The were first discovered in the Great Lakes in 1988 and now pose a multimillion-dollar threat to industrial and drinking water supplies as well as to North America's native aquatic ecosystems.

Their explosive reproductive abilities and ability to cling tenaciously to any solid object are the problems. They set as larvae on any hard substrate, such as intake pipes or boat bottoms, and stick themselves to the surface via a tough, stringy excretion called byssus.

Zebra mussels also produce free-swimming larvae that are able to move anywhere the water flows or goes. Because they are an exotic species, they have few predators and populations are rapidly expanding.

Zebra mussels are now found in all the Great Lakes and are spreading rapidly down the Mississippi River basin. They've also moved down the Susquehanna, Hudson, Ohio and Illinois rivers and into Kentucky Lake in the lower Tennessee River system. Some researchers predict zebra mussels may hit North Carolina lakes and rivers by next year.

Colonies of up to 60,000 mussels per square meter have been reported and the sheer quantity of them is clogging intake pipes for water plants. Beaches are being covered with smelly shells that discourage recreational activities. Biologists fear the hardy exotics will displace native mussels and other aquatic species.

Some worry that the filter-feeding mollusks could disrupt the entire aquatic ecosystem, and harm North Carolina's fishery resources. "A place like Jordan Lake is extremely rich in nutrients." said John Alderman, a Wildlife Commission nongame biologist and freshwater mollusk expert. "It's possible you could see these nutrients concentrated in zebra mussels instead of distributed in the water column where other organisms, including gamefish, can utilize them. If there's nothing for bass and bream to eat, populations of popular fish could be reduced. There's great potential for disruption of the food web."

North Carolina's lakes, rivers and low-salinity sounds may be affected. Public water supplies could be especially vulnerable in North Carolina. "Our state's population is spread out all over the state and many municipalities draw their water from a host of different streams and lakes," he said. "Therefore, if the mussel gets loose in our waters, it could affect many, many water plants instead of just a few." Costs will eventually come out of consumer pocketbooks as water plants spend millions to combat the pest.

Zebra mussels are innocuous-looking mollusks about 1 to 2 inches in length. Their D-shaped shells are usually yellow or brownish in color, and are often striped with alternating bands of color, hence the name "zebra." However, they can be almost solid white to dark brown in color, depending on the location they colonize.

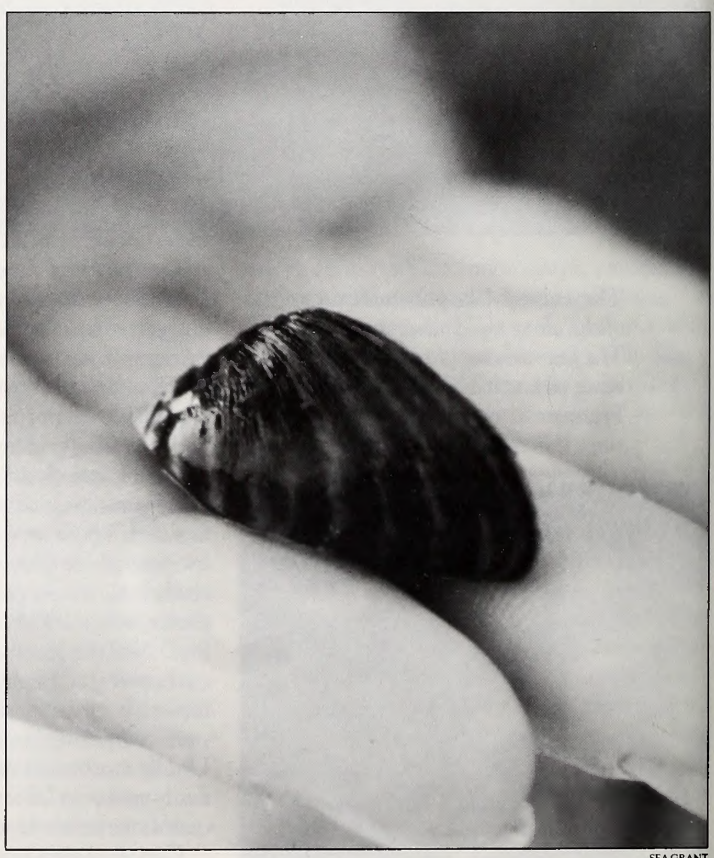
Boats, with mussels on their hulls, are inadvertently spreading the mussels across the nation as they move from one body of water to another. The mussels can even attach themselves to the interior of motor cooling systems. Biologists are urging the public to take a few precautions to prevent or slow the mussels' spread to North Carolina.

- Boaters or anglers traveling to infested areas should clean their boats, trailers and motors, and carefully inspect for mussels. Ideally the boat should be washed with hot water and should be allowed to dry for two to seven days to kill any attached mussels. Tournament anglers, who travel from state to state, should be especially careful.
- Bait wells should be drained and dried before moving to another location. Never discard bait or water taken from an infested state—and potentially containing free-swimming larvae—into another location.
- Report any zebra mussel you find. Look for the characteristic zebra stripes, but the most reliable indicator would be the stringy byssus thread that attaches the mussel to an object.

Biologists are very interested in obtaining a zebra mussel specimen and learning the location where it was found. If you find any zebra mussels, do not throw them back. Instead place the mussel or cluster in a small jar of rubbing alcohol.

Send any specimen to John Alderman, Nongame and Endangered Species Section, N.C. Wildlife Resources Commission, 512. N. Salisbury St., Raleigh, N.C. 27604-1188.

*Some information courtesy of UNC Sea Grant.*



SEA GRANT

***Aquatic Alien:*** *Researchers predict the zebra mussel may soon invade North Carolina waters, potentially causing millions of dollars of damage to water supply and plants, and disrupting native ecosystems.*

*10th Anniversary Issue Should Be Popular*

## New North Carolina Duck Stamp and Print Available

A pair of widgeon flushing against the picturesque backdrop of the Bodie Island Lighthouse near Oregon Inlet and the Pea Island National Wildlife Refuge are the subjects of the 1992 North Carolina waterfowl stamp and art print.

This year marks the 10th anniversary of the N.C. Wildlife Commission's waterfowl stamp and print program, and is the fourth consecutive year that one of North Carolina's seven coastal lighthouses has been featured. The 10th anniversary also heralds the return of renowned artist Richard Plasschaert who painted North Carolina's highly successful first-of-state duck stamp print in 1983.

This 10th anniversary commemoration, in conjunction with the popular lighthouse series and Plasschaert's skill's, should make this year's print and stamp especially desirable for collectors and investors. In the past, both the stamps and prints have shown excellent investment potential, and both have benefited from increased interest and demand shown by collectors of the lighthouse series.

"Looking at new stamp issues in the past 20 years, duck stamps in general have probably outperformed all other groups of stamps," said Doug Mattox, owner of Mattox Coins & Stamps in Raleigh. "North Carolina's first duck stamp is bringing $95 on the collector's market right now." In 1983, this same stamp sold for only $5.50.

North Carolina's duck stamp prints remain very collectible, especially the first-of-state issue and those featuring North Carolina lighthouses. "The lighthouse series has really been magnificent for North Carolina," said Bill Cable, an art print dealer in Raleigh. "These prints have attracted new collectors who are collecting the series featuring lighthouses."

Ten years ago, the N.C. Wildlife Resources Commission began its duck stamp program to raise funds for waterfowl conservation, including habitat acquisition and improvement in the state. Purchase of stamps was voluntary until 1987. Since then, waterfowl hunters in North Carolina have been required to buy a state waterfowl license in addition to the federal waterfowl stamps.

The money generated by the sale of state duck stamps and from print royalties goes directly into the Wildlife Commission's special Waterfowl Fund, which has raised over $2.1 million. The fund is used specifically to help waterfowl.

***Repeat Performance:*** *Artist Richard Plasschaert, who painted North Carolina's first duck stamp, returns this year for the Tenth Anniversary stamp and print, which features a pair of widgeon flushing against the backdrop of the Bodie Island Lighthouse.*

*Features Brook Trout*

## New Sportsman's Stamp Print Available

North Carolina's 1992 sportsman's stamp and art print feature a brook trout feeding on mayflies. Brook trout, locally known as "speckles" for their brilliant dappled green and gold coloration, are North Carolina's only native trout. This print will be the ninth in the sportsman's stamp and art print series.

Wildlife artist Duane Raver of Cary painted the scene, set on a pristine Appalachian mountain stream. Raver, who has been named "Wildlife Artist of the Year" by the N.C. Wildlife Federation on numerous occasions, is noted for his wildlife art, especially for his paintings of fish.

Buyers of the state's annual sportsman's license receive the sportsman's stamp each year. The prints and stamps are available from art dealers through Dec. 31, 1992. After that time, remaining sportsman's stamps and prints will be destroyed. A Wildlife Commission policy requires that all unsold art prints and stamps be destroyed six months after the stamps expire as legal licenses. This helps increase the collectible value of both the prints and the stamps.

***Sportsman's Dream:*** *Artist Duane Raver painted this year's sportsman's stamp and print of a brook trout feeding on mayflies in an Appalachian stream.*

*Still Swimming in Jordan Lake*

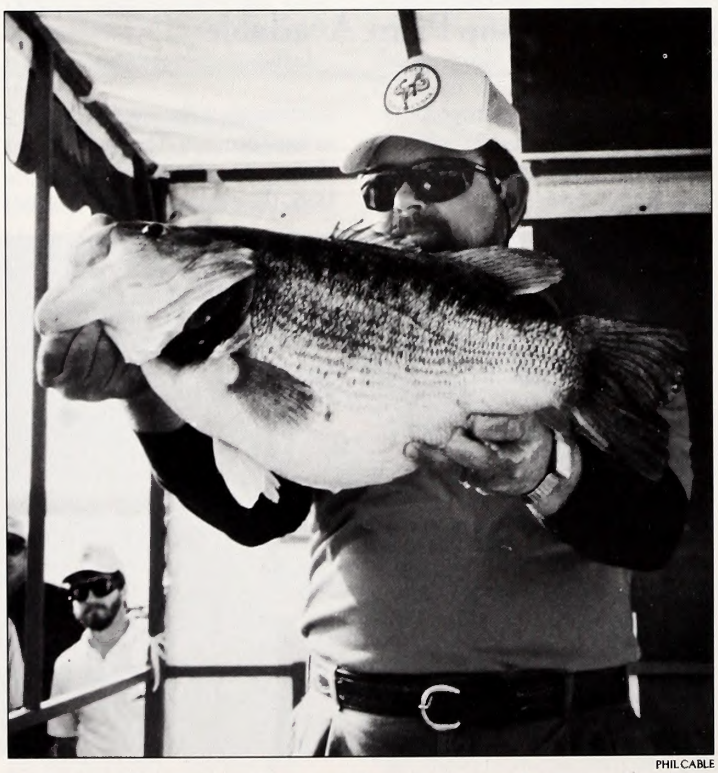
## Angler Catches, Releases Huge Bass

It takes a really good fisherman to catch a bass that weighs over 14 pounds from a hard-fished public reservoir. But it takes an even better one to release it alive. That's what happened this March when Phil Cable of Cary caught a 14-pound, 6-ounce bass during a bass tournament held on Jordan Lake.

After registering and weighing the bass at the tournament weigh station, Cable voluntarily released it back into Jordan Lake. Cable, known as one of Jordan Lake's best bass fishermen, said his dedication to the catch-and-release concept was behind his decision to return the fish. "I didn't have to release it nor was I paid to release it," Cable explained. "I thought that if I could turn back a 14-pound plus fish, then maybe I could set an example for other anglers to release big bass."

Cable, who has two 10-pound fish mounted on his wall, said he had reached the point where keeping a big fish was no longer important to him. "Considering everything that 14-pounder gave me—a tournament win and satisfaction—there was no way I could kill her," Cable elaborated. "It's been a good feeling and I've had plenty of positive comments about doing it."

The bass hit a chartreuse spinnerbait fished in about one foot of water off a point in the main portion of the Jordan Lake. Cable's partner subsequently landed two 8-pound fish off the same point, and their seven-fish stringer, weighing 45.68 pounds, edged out a nine-fish, 45.25 pound stringer to win the tournament.



PHIL CABLE

***Still Alive:*** *Phil Cable of Cary caught this 14-pound, 6-ounce largemouth from Jordan Lake then returned it alive to promote catch-and-release angling ethics.*

*Slated June 7-13*

## Safe Boating Week in June

KEN TAYLOR

***Safety First:*** *National Safe Boating Week will be observed June 7 to 13. Wearing a personal flotation device, observing and obeying boating regulations, and avoiding alcohol use will reduce fatalities and deaths from boating accidents.*

*Landowner Ambushes Himself*

## Man Requests Decoy, Then Shoots It

Under the "you reap what you sow" category comes a recent illegal deer hunting case in Caswell County. It seems a local landowner had been having problems with deer poaching and illegal night hunting on his property. Not only did he ask Wildlife Commission enforcement officers to use a deer decoy in the area, but he also showed the officers where they could hide so that they could catch any culprit.

When the deer season opened, Sgt. Douglas Flake of District 5 set up a decoy and staked out the area. After spotting the decoy one afternoon, a vehicle stopped and the occupant fired two shots at the decoy.

Upon confronting the violator, guess who the officers found? The landowner! According to Sgt. Flake, the embarrassed man's first words were, "I really messed up this time. I just got greedy." He was found guilty of illegal road hunting and hunting from a vehicle and was fined $100 plus $55 paid in court costs.

## Duck Stamp Society Forms

A new organization has been founded for those interested in collecting migratory bird stamps. The organization, called the National Duck Stamp Collectors Society, has applied for non-profit status. It will be open to all interested in collecting these valuable wildlife stamps.

Several types of memberships will be available. For more membership information, write David Green, 2512 Woodridge, Harvey, La. 70085.

*Hikers and Hunters Will Like It*

## Trail Guide for Uwharries Available

Sportsmen or other users of the Uwharrie National Forest now have a guidebook that can make a hike or hunt a lot easier. The booklet, titled *Sportsman's Guide to the Uwharrie Trail and the Birkhead Mountains Wilderness*, is a 91-page pocket-size trail guide. Written by Bob Finley, it was compiled with the aid of a calibrated surveyor's wheel to provide extremely accurate directions.

The guide focuses on the 41.7 miles of the Uwharrie Trail, Dutchmans Creek Trail, Camp Three Loop Trail, Robbins Branch Trail and Hannah's Creek Trail, all located in the Uwharrie National Forest area. In it are directions on how to get there, how long trail segments are, their difficulty, campsite and water sources, and scenic overlooks and other trail descriptions. The guide is designed to stand alone, although supplemental maps available from the Forest Service would be useful to those not familiar with the forest. The guide should be very helpful to hunters who use the trail area. The scenic Uwharrie Mountains are said to be the oldest mountains in North America, and deer hunting is popular in the area.

Some of the proceeds from the booklet will go to benefit the Boy Scouts, who assisted in mapping some of the trails. It is available in bookstores, outdoor equipment shops or for $8.50 postpaid from the author. To order, write Bob Finley, P.O. Box 5095, Burlington, N.C. 27215.

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before traveling to an event. Listings for this calendar should be conservation-oriented and should be sent at least four months in advance.

**June 1-30**

American Rivers Month will be celebrated around the nation and state. Check local papers for fishing events, canoe trips, river festivals and education seminars. For more information, contact American Rivers, 801 Pennsylvania Avenue S.E., Suite 303, Washington D.C. 20003-2167.

**June 12**

Open House for The Nature Conservancy—North Carolina Chapter at Macrae Meadow, Grandfather Mountain in Linville. Open to general public. Outdoor concert and environmental education activities for children will be included. For more information, contact The Nature Conservancy, N.C. Chapter, Carr Mill, Suite D-12, Carrboro, N.C. 27510.

**June 13**

Environmental Educators of North Carolina conference will be held at N.C. Zoological Park in Asheboro. For more information, contact Melva Okun, Institute of Environmental Studies, 315 Pittsboro St., CB#7410, Chapel Hill, N.C. 27599-7410.

**June 26-28**

The Southeastern Nature Artists Conference, held at Vance-Granville Community College in Henderson, will feature workshops, art shows and competitions. For more information, contact N.C. Nature Artists Association, P.O. Box 1193, Cary, N.C. 27512-1193..

*Go Fishing June 1-7*

## National Fishing Week This Month

KEN TAYLOR

***Go Fish:*** *National Fishing Week will be celebrated across the nation June 1 to 7, and this year's theme will focus on family fishing traditions. Check local papers for events in your area.*

## Wildlife Endowment Fund Report

**March 1992**

Principal Balance
$16,706,794.29

Interest Earned
$9,189,019.37

Total Receipts
$25,895,813.66

Interest Used
$3,282,016.48

Fund Balance
$22,613,797.18

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

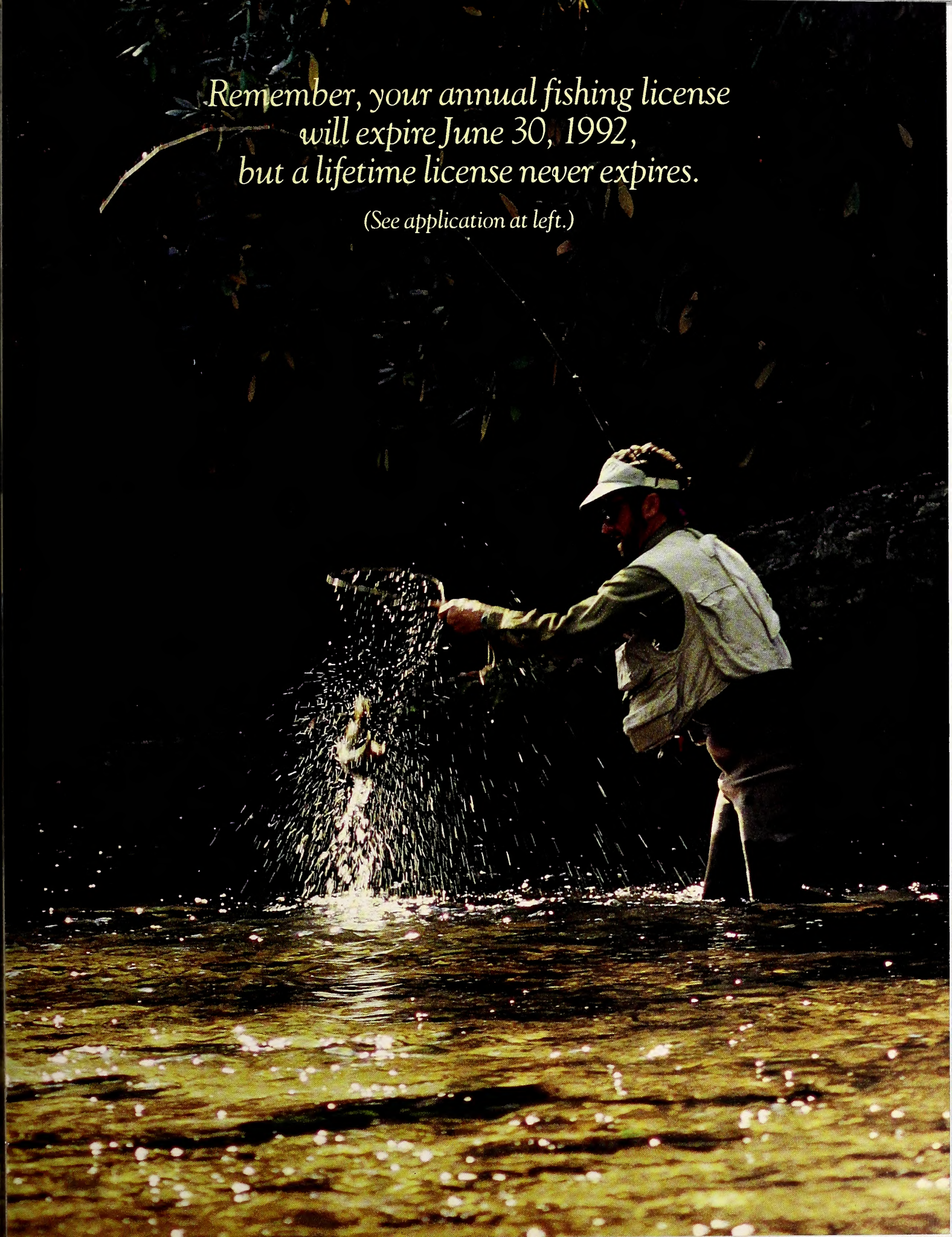
# Fact Sheets and Hummingbird Hints

*by Vic Venters*

June is a month for excuses. I know the fish are biting and, yes, there's yard work to do. Still, the hummingbirds are hungry. And go easy on the farm pesticides.

*Hummingbird Feeding:* The hummingbirds are back. The most natural and best way to attract them to your yard or natural area is by planting nectar-producing flowers—columbine, for example. However, hanging inexpensive hummingbird feeders is an acceptable substitute. Although going the feeder route may seem easier than the chores associated with flower gardening, you must maintain a fresh supply of sugar water in your feeders. In the hot summer sun, sugar water can become easily contaminated by bacteria and can harm the birds. Change the solution at least once a week or if the water becomes cloudy. Rinse and clean your feeder thoroughly if it shows signs of contamination. You can either buy a prepared hummingbird solution at specialty bird or pet shops or you can make the solution by dissolving one part sugar in four parts hot water. There's no need to add any food coloring to the solution as the red on the feeder should be enough to attract our fast-winged tropical friends. Also, never use honey as a sugar substitute in the solution because of possible fermentation and contamination problems.

*Pesty-cides:* For the planting and growing season this year, be especially careful with your applications of pesticides. Wildlife doesn't like or thrive in a poisonous environment any more than you would. Pesticides are a fact of modern farming, but to help you minimize negative impacts associated with their use, the Cooperative Extension Service and the Wildlife Commission have teamed up to produce a series of easily understood fact sheets that show which chemicals can get the job done at the least cost to wildlife. The fact sheets cover pesticide use with these crops: soybeans, corn, tobacco, cotton, peanuts, small grains, fruit trees and Christmas trees. Check with your local Extension Service agent or write the Cooperative Extension Service—NCSU, Box 8003, Raleigh, N.C. 27695-8003. Best of all, they're free for the asking and can make a positive impact on your farm's wildlife.


Remember, your annual fishing license
will expire June 30, 1992,
but a lifetime license never expires.
(See application at left.)

**Linville Falls**

Winding through the Linville Gorge Wilderness Area, the Linville River is popular with hikers and trout fishermen, and this handsome waterfall is a favorite rendezvous. The falls can be seen from the overlook at Wiseman's View.

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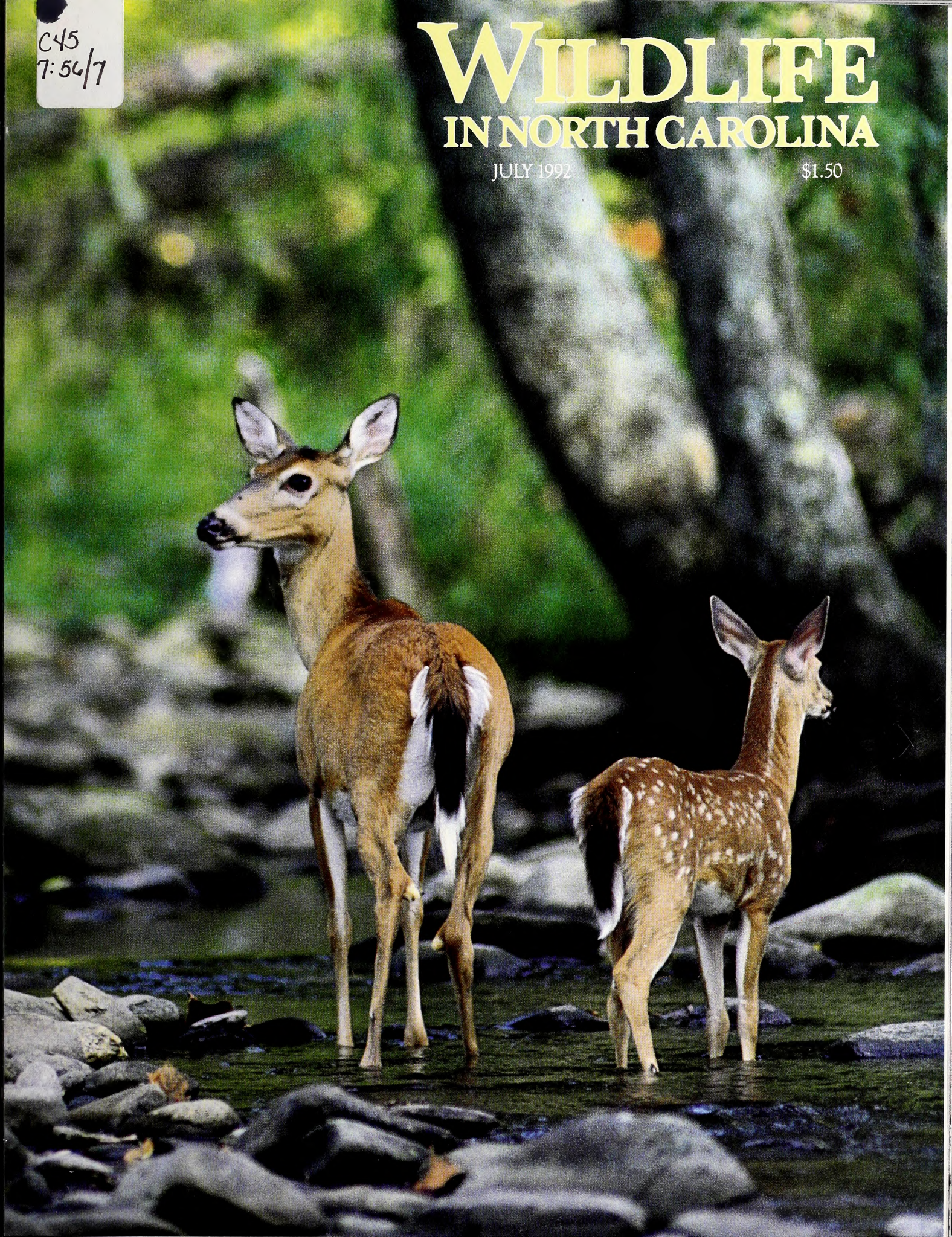

# Let The Good Earth Roll

*by Jim Dean*

Jack Avent and I were fishing the large bed of lily pads so intently that we didn't notice the man and his wife at first. They were sitting on a dock on the opposite side of the small cove.

"You ain't going to catch anything today," the man said as we reached the end of the lilies near the dock. There was a slight edge to his voice, not exactly unfriendly, but with a hint of challenge as though daring us to disagree.

"Well, maybe a couple of little ones will make a mistake," Jack hedged. Actually, we'd already landed seven or eight bass farther down the lake, but we long ago learned that it's never a good idea to encourage potential competition.

JIM DEAN

"Won't happen," said the man." Fish never bite when the earth's rolling."

"You're right, it's a bit windy, but we've had pretty good..." The man cut Jack off.

"It ain't wind," he said, his eyes flashing. He seemed truly offended that Jack wasn't in complete and immediate agreement. "Any fool can tell the earth is rolling today. Fish know it. You ain't gonna catch nothing. Earth's rolling. Look at it. It's rolling, all right."

Jack didn't answer, but looked at me, one eyebrow slightly raised. I pictured the earth spinning easily on its axis like a giant top until the tip of Antarctica hit a knothole on the cosmic floor and the whole orb began to wobble wildly. I was willing to concede that fish and fools, including me and Jack, might notice such a thing.

Jack backed the boat up so that we could fish the lilies again. "You suppose he's had a few snorts, or is he serious?" he half-whispered. "I thought I'd heard every excuse in the book, but I believe I'd give a twenty dollar bill to catch a bass in front of that guy."

Jack's money was safe, unfortunately, but that's luck for you. Or maybe it's just hard to make accurate casts when your planet is on a toot. As we left the cove, I glanced over my shoulder at the man. He'd given up on us and was jawing at his wife. She looked as though she had a working familiarity with his theory.

Fishermen are infamous for excuses, some more seriously ventured that others. When I was a kid, my grandfather would explain that I wouldn't catch fish unless I held my mouth right. The twinkle in his eyes gave it away, but I'd try several different mouth holds anyway. No need to take any chances. In fact, I think I had his advice in mind when I smoked my first cigar years later. Maybe the right way to hold your mouth was to clamp it around a stogie. After all, Grandpa had smoked Muriel Senators, and he'd caught fish when I hadn't. Didn't work, by the way.

Over the years, I have tried to remember all the whimsical reasons I've heard that attempt to explain why fish don't bite. "I used to hear you couldn't catch fish if you put the worm on the hook backwards," said Jack. My long-time ocean pier fishing buddy, Pete Leo, explains that you have to call fish. We always laughed, but after he'd catch half a dozen, you could hear grown men up and down the pier chanting "Here fishy, here fishy."

Like folk remedies, some of these superstitions and home spun beliefs seem to have merit. Surely you've heard this old rhyme: "When the wind's in the East, fish bite least; When the wind's in the West, fish bite best; When the wind's in the South, it blows the bait into the fishes' mouth."

I used to think this was pure foolishness, but now I'm not so sure. On freshwater lakes and ponds in North Carolina, at least, winds out of the west or southwest usually accompany relatively stable weather, and that's often better for fishing. On the other hand, a sharp cold front or a northeaster almost invariably creates a day or two of poor fishing. Prevailing wind direction is connected to weather patterns, barometric pressure and other meteorological influences that really do affect fishing.

And what about solunar tables? The influence of the moon on tides is well known, but do moon phases really affect fishing? Try to convince a bluegill fisherman that the moon doesn't influence spawning and fishing success. I've been a doubter, but I honestly don't know. Even so, I'd be careful how much trust to put in calendars that have those little "fish" symbols to indicate when the fishing is good. I'm not calling any names, but I once asked a calendar designer how she knew which days were good. "Oh, I don't," she said. "I just stick 'em on anywhere."

The best advice I know in these matters is quite simple. When you can arrange your affairs to go fishing, forget all the signs, homilies, advice and folklore. Just go. But while you're out there you might want to hold your mouth right.

July, 1992
Volume 56, Number 7

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Cover** *A white-tailed doe and her fawn cross a mountain stream. Photographed by William S. Lea*

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***Stalking clams and other bivalves,*** *a whelk is an efficient marine predator that prowls coastal waters. The whelk grasps a clam in its muscular foot and forces the clam's shells apart. Inserting its long proboscis inside, the whelk uses its toothed tongue to lap up the clam's flesh.*

# The Hungry Whelk

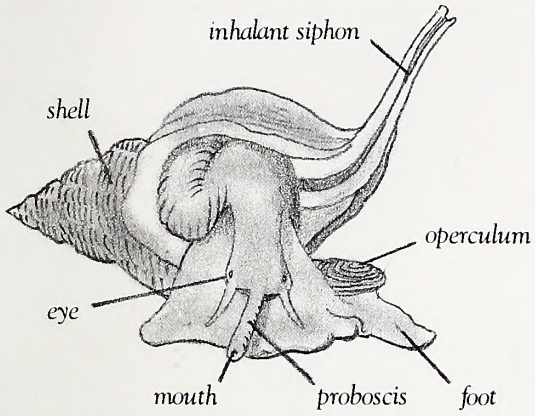
*written by Lawrence S. Earley*
*illustrated by David Williams*

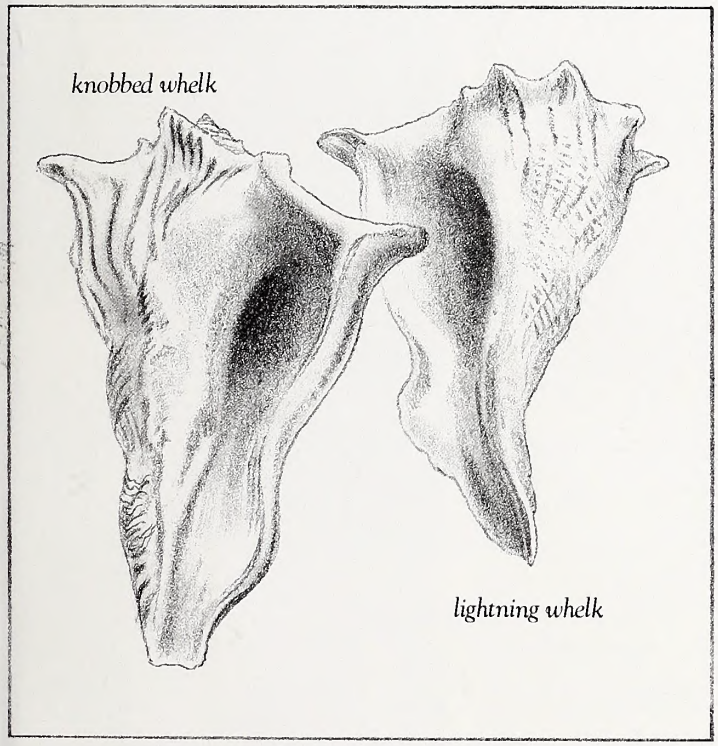
A whelk is a large marine snail with a spirally coiled shell that some people call conchs and collect to decorate beach cottages. At least that's the way most of us think about whelks, if we think of them at all.

Few of us ever stop to consider the animal that once inhabited the lovely shell, and that's too bad. For the creature that once coiled inside is one of the most fearsome predators in our marine waters. Just ask a clam.

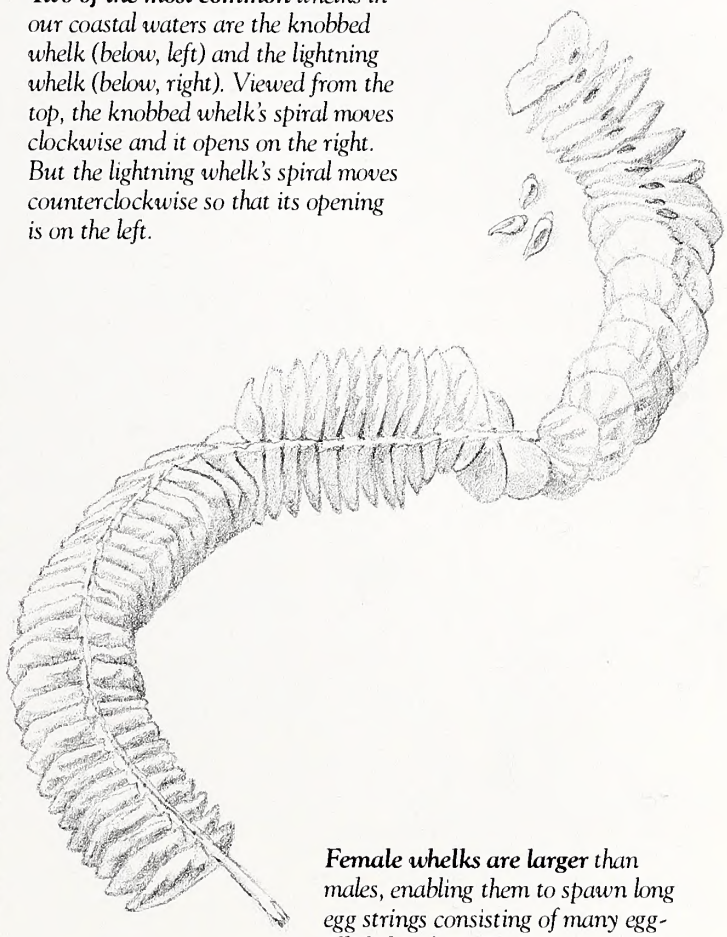
To understand this large snail's predatory prowess, put it at the other end of an aquarium tank from a group of clams and watch it go. Knobbed whelks have been timed at the leisurely pace of about 4 meters per hour, so you may have to wait awhile. But drawn by odor, the whelk will make its way toward the clam, digging it out of the sand if necessary and enveloping it with its fleshy foot. Placing the leading edge of its shell between the two halves of the clam shell, it will try to pry them apart. A piece of the clam shell usually breaks off under the pressure, enabling the whelk to insert its proboscis inside the opening. About three eighths of an inch in diameter, the proboscis is the snail's mouth, armed with a toothed tongue called the radula that acts like a grater shredding the flesh from the living clam.

Both clams and whelks are mollusks, the second-largest group of animals on earth after the insects. The clam is a bivalve and the whelk, along with conchs and periwinkles, belongs to the gastropod class. Conchologists, or students of marine mollusks, say that adult whelks are almost exclusively




***Two of the most common*** *whelks in our coastal waters are the knobbed whelk (below, left) and the lightning whelk (below, right). Viewed from the top, the knobbed whelk's spiral moves clockwise and it opens on the right. But the lightning whelk's spiral moves counterclockwise so that its opening is on the left.*



***Female whelks are larger*** *than males, enabling them to spawn long egg strings consisting of many egg-filled chambers. These egg strings are attached to the sea bottom. The eggs hatch into tiny whelk larvae which in time will escape through a hole in each parchment-like chamber.*

carnivorous, slurping up crustaceans, marine worms and fellow mollusks such as clams and oysters, along with occasional carrion.

In our waters the commonest whelks are the knobbed whelk, the lightning whelk and the channeled whelk. The knobbed whelk is aptly named for the prominent knobs on its shoulder. The lightning whelk looks like a knobbed whelk, but it grows larger in our area, up to 16 inches long compared to 10 inches for the knobbed whelk. Its opening is somewhat contrarily positioned on the left. This makes it a "left-handed" gastropod, which is unusual because most gastropods are "right-handed." The adult channeled whelk is smaller and has a thinner shell than the other two.

Adult whelks are mostly gray in color, although the inside of the shell, in the opening, can be very brightly colored—ranging from pale yellow to orange or even burgundy.

Whelks live both offshore and in the protected waters of our sounds. They mate in the spring and again in the fall. In early spring, the female lays long egg strings consisting of interconnected chambers shaped like thick wafers. Inside each capsule may be dozens of eggs that gradually develop into tiny whelks. The whole string is anchored in the sand or other material at the bottom of the sound or ocean. It may take the female whelk several days to lay strings consisting of over 100 chambers and containing up to 6,000 eggs. These young whelks will leave the capsule through a pre-weakened spot in the capsule and immediately begin to crawl away. Like many young sea creatures, very few will survive.

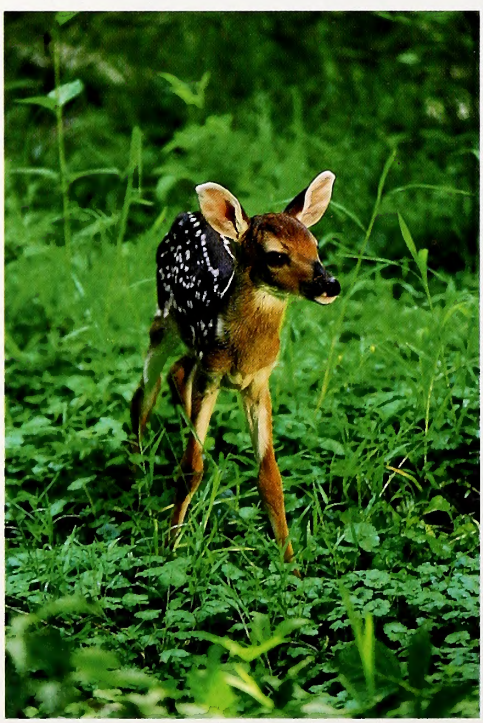
The beautiful spiral form of the whelk shell once led an early student of gastropods to write, "God hath bestowed upon this humble architect the practical skill of a learned geometrician." More recently its beauty almost convinced state legislators to make the whelk North Carolina's state shell, but then its appetite for the economically important clam became known. Instead, the Scotch bonnet was chosen, a noble beast but, some might say, hardly in the same class as the whelk.

# Lazy, Hazy Days for Deer

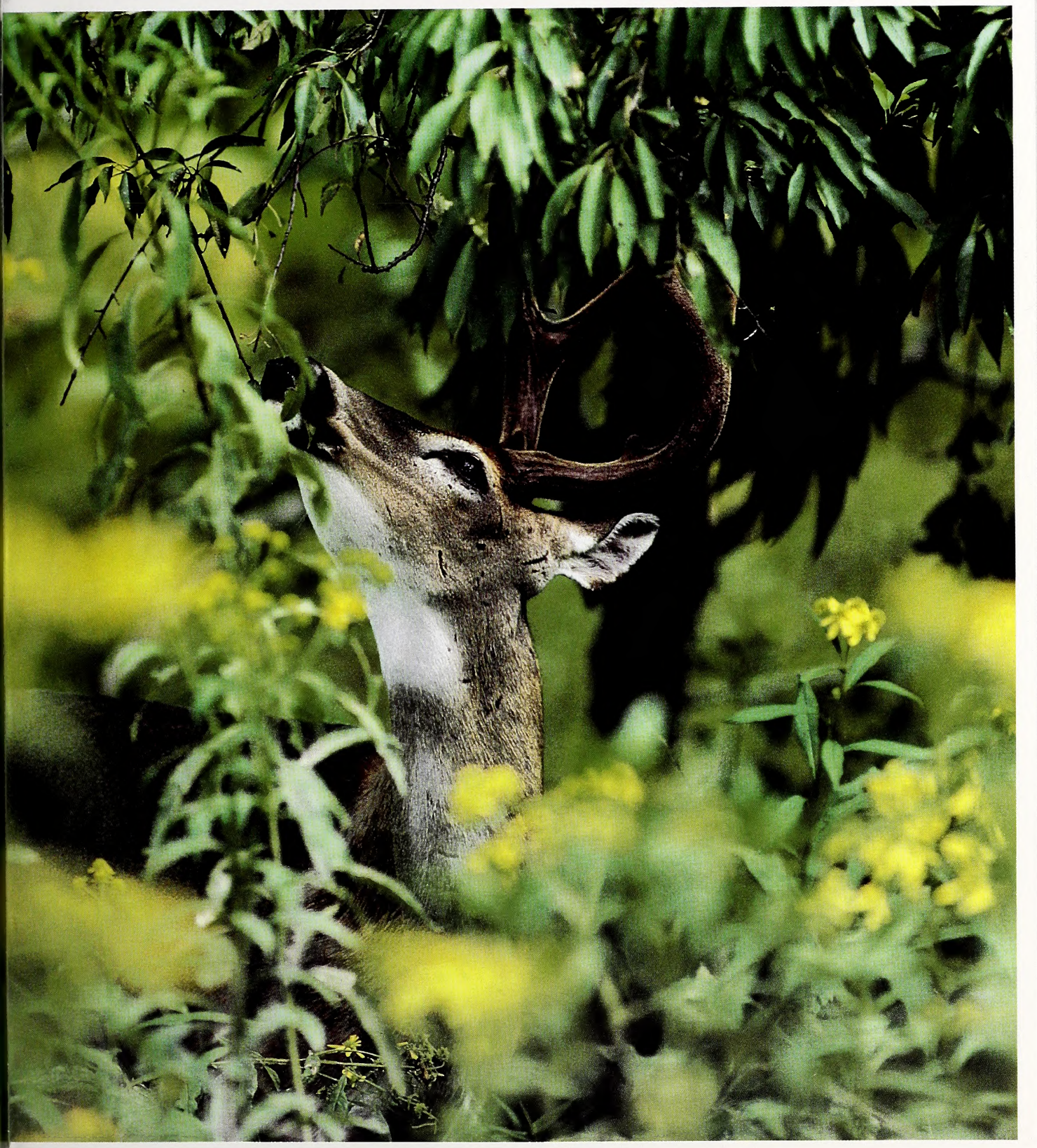
For white-tailed deer, summer is the time to raise young, grow antlers, eat heartily and hang out.

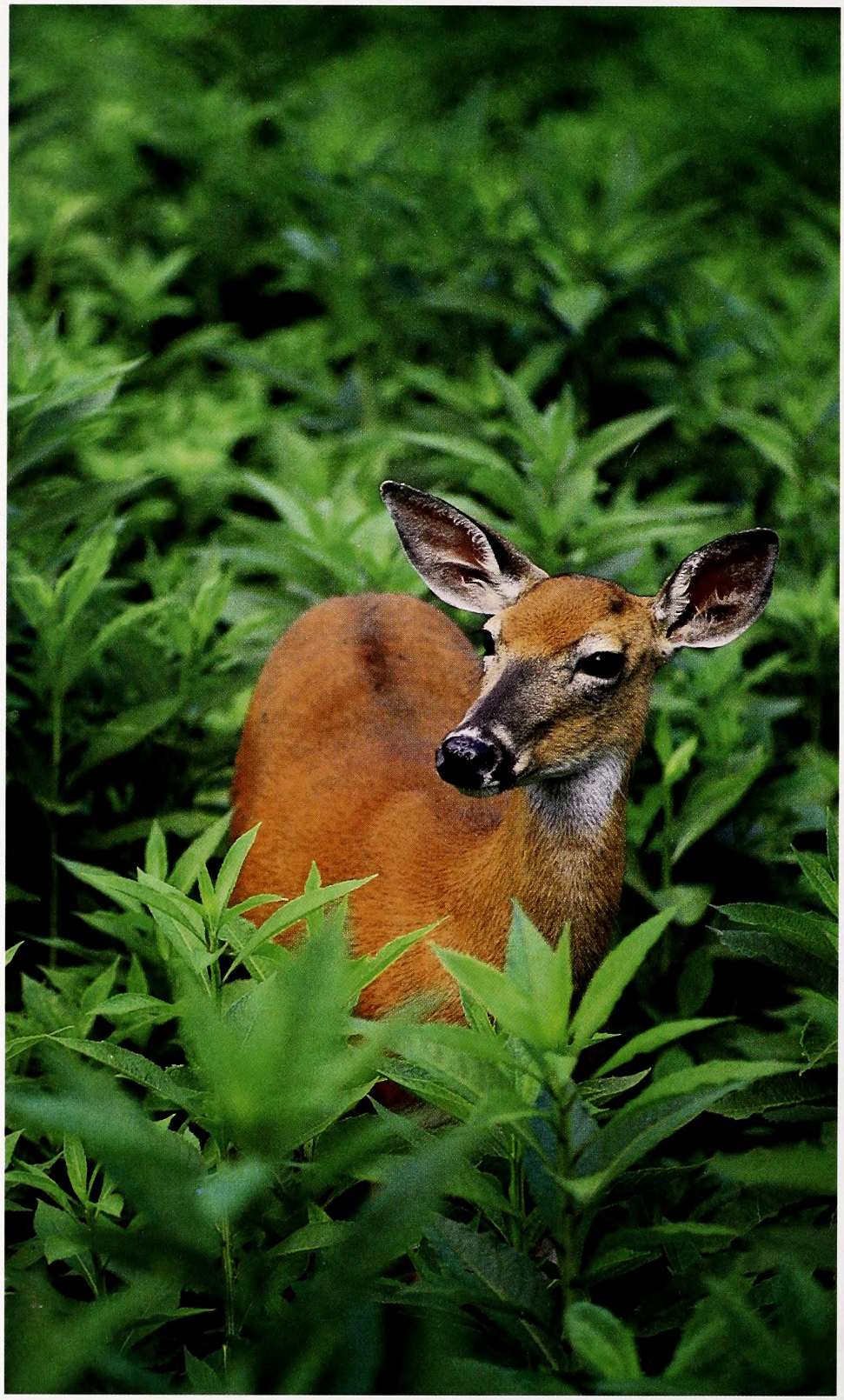
photographed by William S. Lea ©1992

It is in fall that white-tailed deer attract most of our attention, and their autumn behavior is well known to sportsmen and wildlife enthusiasts alike. Yet whitetails are also creatures of summer, though with very different habits from those seen in the cooler months. Eating and growing occupies much of their agenda, from the newly born fawn seeking to put on weight to the proud and majestic buck fueling antler growth and strength. It is a time of plenty for whitetail, a period of relative safety. But they will need what they gather today for the harder winter months ahead.



***To survive, fawns** must remain undetected by predators. Born nearly odorless and covered with camouflaging spots, whitetail fawns instinctively freeze at the slightest hint of danger. Adult whitetails, such as this buck, are browsers and grazers. As opportunistic feeders, deer will dine on a summertime menu that might include leaves, various grasses, fruits, lichens, mushrooms and other delicacies.*





**The whitetail's summer coat** *can easily be recognized by its reddish color. With more hairs per square inch than the brown winter coat, it provides some protection against biting insects. Whitetails are always alert for potential danger. Should a predator arrive on the scene, deer will quickly flee from open ground toward the protective cover of the forest.*

**One sight you will not** *encounter during the fall or winter is a bachelor herd. During summer, whitetail bucks will often travel and feed together. These loose social groups may remain cohesive until fall, when they disperse as the rut, or breeding season, approaches. For bucks, much of the summer's feeding provides nutrients for antler growth, shown here in the "velvet" growing stage. By late summer, usually September, the antlers become hard and the velvet cracks and is shed.*

# Mid-Summer POND TACTICS

So what if it's hot, you can still catch bluegills and bass in small ponds.

written and photographed by Joe Albea ©1992

The aroma of curing tobacco permeated the dawn as we turned off the black top and onto a logging path. Though bumpy, the path saved us 15 minutes, and we were soon sliding the 14-foot flat-bottom johnboat into a secluded farm pond.

This is one of those ponds you dream about, full of 1-pound bluegills and a sizable number of trophy largemouth bass. We had last fished the pond in May when the bluegills were still on the beds. We'd had great success, but now it was midsummer and hot.

We weren't worried about catching fish, however. Through the years I have developed an attack plan for fishing summer ponds that's based on fish movement. During the steamy days of a Carolina summer, bass and panfish are fairly predictable in their day-to-day activities. Once you understand the way fish move in a pond, and where they're likely to be at various times of the day, you'll catch more of them.

The shoreline on this pond is as diverse as any that I fish. It has numerous areas of grassy shoreline water 10 to 18 inches deep extending into the grass. Small pockets of open water offer perfect spots for panfish and bass to ambush meals. Another area, perhaps 100 yards long, consists of overhanging myrtle bushes that offer shade and protection. Finally, there's an area where lots of fallen timber and stumps round out the structure.

When we reached the far side—the one with the grassbeds—the bluegills and shellcrackers were already feeding. Although sunrise was still 30 minutes away, life on the pond was stirring.

I reached for my fly rod as Bill, who was using ultra-light spinning tackle, tied on a small Beetle Spin. I'd tied on a Sneaky Pete cork earlier so I was ready. Bill quietly worked the boat into position and we made our first casts. We knew from past experience that the panfish cruise the shallows in early morning. This is generally the coolest time of day during the summer months, a time when everything in and around the pond is more active.

The slurps and pops of surface-feeding panfish told me that my selection was appropriate. On my second cast, a plump bluegill inhaled the bug as soon as it hit the water. After a brief fight I drew him to the side of the boat and quickly placed him on the stringer. By then, Bill had hooked his first fish of the day. His ⅛-ounce white Beetle Spin had attracted the attention of a bluegill a bit larger than my fish. Soon, his fish was also on the stringer.

Bill held the aluminum boat in position as we continued to move quietly down the grassy shoreline. Within the next 30 yards we picked up six more bluegills and a very respectable shellcracker that gave Bill's ultralight combo and 4-pound test line a real workout.

Just as we were about to leave the grassy area, we spotted a commotion in a pocket of open water in the grass. Bill grabbed his casting outfit that already had a frog-colored Devil's Horse on it. I quietly dropped the anchor to keep us in position. His cast was perfect, and the top-water plug landed several feet beyond where the fish swirled. Bill let the lure sit quietly until the water had settled, then gave it a slight twitch. Nothing happened so he repeated the motion.

***Fly-fishing with** popping bugs for bluegills can be good through the hottest part of the summer in many ponds, especially early in the morning and again in late afternoon. At other times of the day, sinking flies or live bait like crickets are better.*

CCC

Suddenly, we saw a wall of water pushing in the direction of Bill's lure. He tightened his grip on the rod as the fish engulfed the lure, then he set the hook on what appeared to be a sizable bass. The bass instinctively headed out of the grass into deeper water, and with the drag set lightly, Bill's line poured from the spool.

When the fish reached open water, Bill tightened the drag to gain control. After a couple of minutes of give and take and one fine jump, Bill brought a nice 6-pound largemouth to the side of the boat, grabbed it by the lower lip and lifted it out of the water. He quickly removed the hooks, held up the fish admiringly, then released it and went back to his ultra-light rod and Beetle Spin.

For the next couple of hours we worked around the shoreline of the pond several times. We added several dozen bluegills to the stringer and caught and released eight bass. They were all close to the surface and feeding actively.

The heat of the mid-morning sun finally began to drive the fish back out into deeper, cooler water. If Bill had not had prior commitments, it would have been the right time to move to the second stage of our pond-fishing strategy. That would have to wait for another trip.

The first part of our strategy had worked exactly as it should. Beginning at dawn, we had concentrated on shoreline structure, and it had paid off. With some exceptions this is often the most comfortable time of day during midsummer, and it's also when fish are most active. We paid close attention to surface action and presented lures that best represented what the fish were feeding on.

We were also careful to be very quiet since we were fishing near shore for fish that were feeding on or near the surface. A paddle hitting the side of the boat or any other unnatural noise will spook fish. We often cover the same shoreline several times in a morning, or as long as we see swirls and other activity. Usually there are fish moving from deeper waters into the shallows regularly this time of day, so it's not a waste of time to fish the same areas again.

One key is to match your lures to the depth of the water and the structure you're fishing. We selected top-water bugs and plugs for panfish and bass. Many fish were feeding on top so we presented lures that imitated injured insects and fish. Small spinnerbaits like the Beetle Spin also work well in the grassbeds, under overhanging bushes and through underwater stump fields because they're nearly weedless. It's a good idea to have several outfits rigged with different lures. Then, as with Bill's first bass, you can respond quickly and quietly when you see an opportunity.

As the temperature rises in mid-morning, the fish head back to deeper water where they are more comfortable. Fish can be caught during midday, but it requires us to change our strategy. Call it Plan B. Your selection of lures should change, and also the way you present them. Now, you're fishing deeper water, and you have to determine where the fish have gone. We look for drop-offs, and they don't necessarily have to be in the deepest part of the pond. Proximity to the shallows may be more important to the fish, especially if these deeper areas have structure. Water only 3 or 4 feet deeper may yield only a slight drop in water temperature but that could be enough to hold fish.

*"We often cover the same shoreline several times in a morning, or as long as we see swirls and other activity."*

In the pond I've described, this is particularly true on the east side where there's an area of submerged stumps and fallen timber. Ten feet from shore the water is 6 feet deep, and that's enough to hold fish on very hot days. The pond's deepest water is 14 feet, but we consistently catch more fish in these areas where the water is only 6 feet deep. Why? We think it's because of the abundant structure found there. This means that you need to know the location of deeper structure in the pond, and how it affects the fishing. Once you locate these areas, then you have everything covered for a full day of fishing.

When fishing the field of submerged stumps for bass, I will usually use soft plastic worms and lizards. A jig with a weed guard or spinnerbaits also work well. For panfish, small Beetle Spins and jigs are probably best because they will not hang up as often as some of the other popular panfish lures.

Deeper areas of the pond with very little underwater cover can be fished with almost any type of lure, even along drop-offs. This is where I like to fish crankbaits that run at various depths. Choose a crankbait that dives to just about the depth of the water so you can fish near the bottom without getting hung too often. Once you locate fish, you can also select other lures that will effectively fish at the proper depth.

Crankbaits, spinnerbaits and plastic worms all work well in deeper parts of a pond. It comes down to what the bass want on a given day. For panfish, the lure selection can be extensive; however, a Beetle Spin has always been one of my favorites, followed by a Mepp's Aglia spinner and a number of tiny crankbaits.

I have found that when fishing deeper water, it is better to slow your retrieve a bit. In deeper water, especially during mid-summer, bass and panfish often continue to feed, but not as aggressively as they do early and late in the day. My most productive deep-water fishing comes when I slow the retrieve to almost a crawl.

There is one exception that often works during the middle of the day when it's hot. If the pond has overhanging bushes that shade a good stretch of shoreline, a combination of shade and structure will attract both bass and panfish. This structure can be extremely productive for panfish that seek the shade to feed or rest.

As the sun falls, the sunlight is no longer as intense. Now it's time for Plan C—or you could call it Plan A again since it's a carbon copy of early-morning pond fishing. Bass and panfish will once again return to the shallows. My most productive afternoon fishing in midsummer comes during the last hour or so of daylight. The afternoon is generally not as comfortable as the morning, but you still can apply the same techniques that were successful earlier in the day.

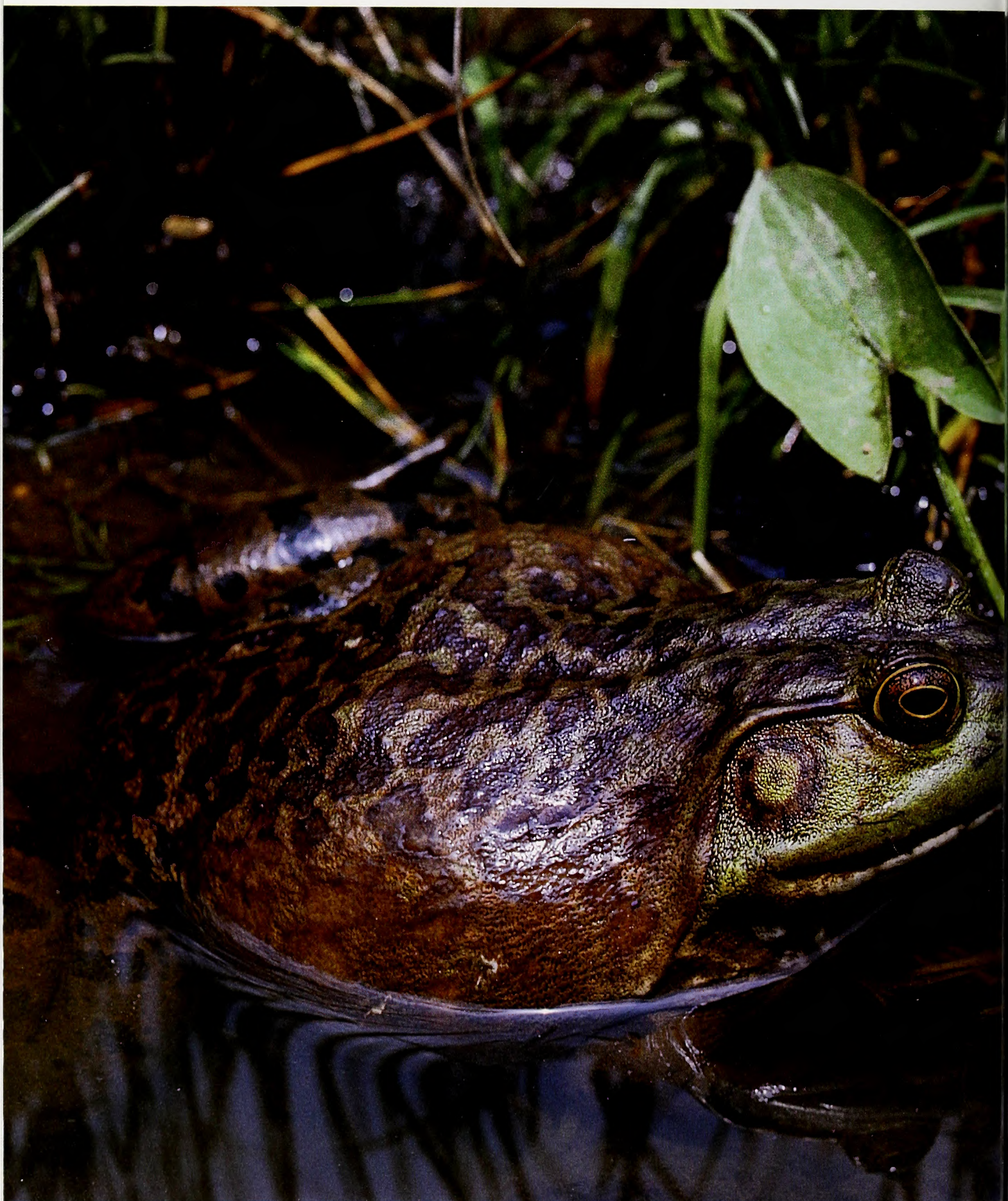
I especially like to cast a Devil's Horse or Zara Spook. Both create a fuss on the surface and draw the attention of feeding bass. A top-water popping bug like the Sneaky Pete is also mighty tempting to a hungry bluegill.

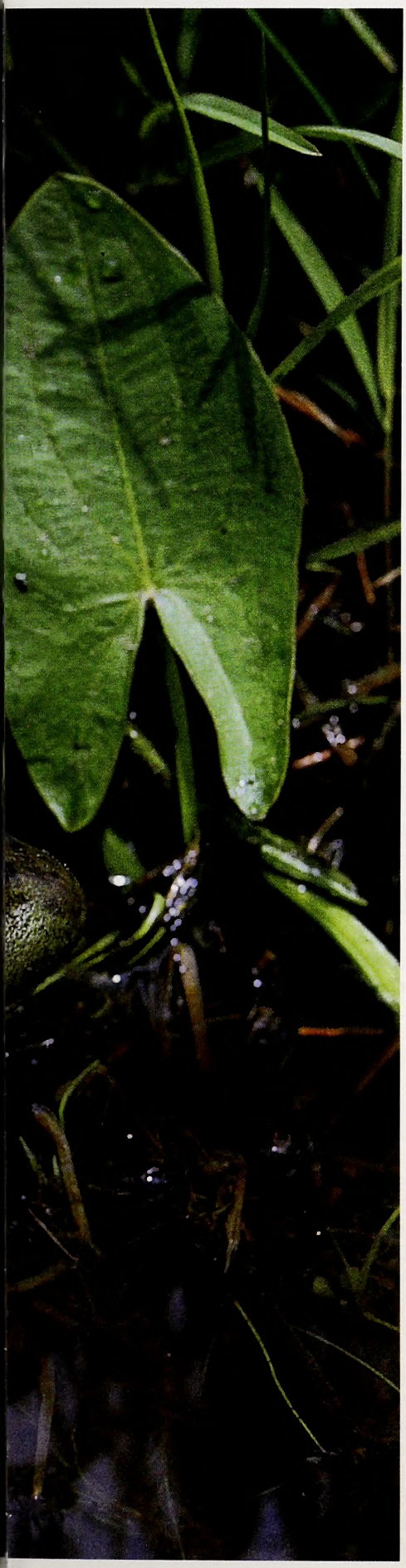
Approaching thunderstorms in late afternoon can also help fishing at times. The sudden drop in air temperature and a light shower can initiate activity across the pond, but don't take any chances with lightning. Get off the pond until the storm passes, but be ready to hit the water as soon as it passes.

Good fishing on a pond will often extend into the night, especially if there have been several days of extreme heat. In fact, night fishing can be quite good using top-water lures that make a lot of noise. If you don't mind the insects and the occasional snakes, it can really be exciting. Sometimes, fishing slacks off for a while when it first gets dark, but picks up again later in the evening. Many experienced night fishermen seem to prefer a dark night.

The key to summer pond fishing is understanding when and where the fish will be. Just keep in mind that good pond fishing doesn't end when the hot summer months arrive. For those who know how to go about it, the fishing can be as hot as the weather. ☒

***While you're waiting*** *for the pond's resident monster largemouth to take a notion to strike one of your offerings, you can have lots of fun with smaller bass. Even in hot weather, pond bass this size are often cooperative.*





# In a Woodland POND

That quiet little pond in the woods is one of the richest habitats on earth. Come see.

written and photographed
by Harry Ellis ©1992

Hidden away in a remote wooded area is a little spring-fed woodland pond that I have come to regard as my own secret world, for few people ever go there. Though I am not the owner of the land on which it occurs, I sometimes feel a little like Henry Thoreau did when he declared that he had gotten more good out of a certain piece of land than the farmer whose name was on the deed. This pond over many years has held a deep fascination for me, and on its banks I have spent many memorable hours as a pond watcher.

In and around this pond, I have found a greater concentration and diversity of life than in most other habitats I know—a constantly changing parade of wriggling, squirming, swimming creatures, both visible and invisible to the naked eye. All the great biological principles of life are embraced in such a common woodland pond, no less than in a great lake or ocean. Here is a world where every animal is both the hunter and the hunted, a world of sudden death, with the struggle for existence carried on in fierce and unending intensity. I love this little pond —less than a quarter of an acre in extent— for the beauty of its flag and rush, arrowhead and cattail, all set in motion by the wind. I love it for its swimming muskrats, its sunning turtles, its clicking dragonflies and plopping frogs, and its water-loving birds. Like thousands of other woodland ponds throughout the country, it is a miniature universe within itself, a unique ecological habitat.

***Bullfrogs prefer large ponds** with lots of aquatic cover. Around the roots and stems of the plants can be found crayfish, waterbugs, snails, small fish and other prey. The bullfrog is the largest frog in the pond.*

My interest in woodland ponds goes back to early childhood. When I was about 7 years old, my family moved to a new location in the Bear Creek section of Mitchell County. On its premises—and almost in our back yard—was a large pond. Some of my earliest recollections relate to the exploration of this pond and the creatures that lived in and around it. There were killdeer that in early spring came crying from the dark hills to settle around the borders of the pond. There were noisy gatherings of red-winged blackbirds that filled the alder thickets around it with their wild rippling songs. Bats in late evening skimmed low over its surface, collecting small moths and other flying insects. I used to walk along its banks, peering into the depths to watch large *Dytiscus* beetles and other predatory insects in their continual search for prey.

I believe that these childhood experiences awakened in me a lifelong interest in the green world of nature that I had been but dimly aware of before, and have led me down many trails of fascination and delight. Though time has a way of sifting through our fingers like the sands of an inverted hourglass, I still have much of that 7-year-old boy inside me—inside a man who can feel the snows of winter coming on.

All the life of a pond depends upon the green magic of *photosynthesis*. This is the amazing process by which plants manufacture food out of sunlight, air and water—food for themselves and nearly all other living things. The transparency of water allows enough light to penetrate for this marvelous operation to be carried on in the pond; few plants grow in muddy ponds, as silt absorbs the light.

Algae—the familiar green pond scum—along with microscopic diatoms, desmids and other simple plants, are the basic plant crop

***A fishing spider hoists** a small fish from the pond. Digestive enzymes from the spider's fangs dissolve the fish's body tissues to aid the spider in eating the fish. This aggressive hunter preys mostly on insects, but, as its name suggests, it is also capable of capturing small fish.*

of ponds. Then there are hosts of microscopic animals—protozoans, rotifers, amoebas and the one-eyed cyclops, to name only a few. These plants and animals make up the plankton "pastures" and form the broad base of the pond's food pyramid. These pastures feed the swarming millions of tiny nibbling creatures which, in their turn, are eaten by crayfish, newts, frogs and large predatory insects. And these, too, are destined to disappear down the gullets of still larger and more powerful creatures, from water snakes, to herons, to voracious snapping turtles.

An interesting pond inhabitant is the parasitic blood-sucking leech (*Placobdella*) that swims through the sunless depths of the pond by undulating its body. It is often seen attached to the skin of snapping turtles. Its flat, butterscotch-brown body is artistically patterned and decorated with darker markings, and that is the most remarkable fact about it. There is no logical reason to explain why a creature that spends its life in the mud and grime of a pond bottom, or attached to an ugly host, should be so symmetrically designed and intricately adorned by nature. It is difficult to see how such decoration would offer a survival advantage, yet its body seems perfected down to the minutest detail. In the words of Thoreau: "Not a snowflake escapes nature's fashioning hand."

Several kinds and colors of crayfish abound in almost every woodland pond. During the day they hide under flat stones or in underwater burrows but come out at night to prey on smaller creatures. They walk along, slowly and jerkily, over the bottom of the pond, but, if threatened, rapidly propel themselves backward, out of the way of danger. The females carry their eggs attached to the swimmerets, on the underside of their abdomens, until they hatch.

At the pond, there is an ever-changing parade of life as the seasons pass. No other part of the landscape seems so devoid of life as an icebound pond in winter, but when spring silently creeps in, the pond vibrates with activity. And perhaps no other group of living things play so great a part in ushering in this new season as do the frogs.

The true herald of spring is the spring peeper (*Hyla crucifer*). These little frogs are small in size but not in voice, for the calls, that sound like the tinkling of distant sleigh bells, can be heard a quarter of a mile away. Each year when the pussy willow catkins gleam like silver around the ponds and the first notes of the peepers are heard, we know that our old Earth has made the full revolution through its orbit and a new spring is upon us.

While most frogs live in or near the water, wood frogs (*Rana sylvatica*) spend nearly all their adult lives among mosses, ferns and other vegetation on the forest floor. Rich reddish-brown with black face masks, they are among the earliest animals to return to the breeding ponds in spring, where their calls sound like the quacking of many ducks. Each female may lay as many as 2,000 eggs, and soon the bottom of the pond is swarming with tadpoles. But out of these many thousands, only a few will survive the hazardous journey from tadpole to mature frog, for their enemies are legion. Practically everything that lives in the pond—crayfish, red-spotted newts, water snakes, turtles, diving beetles, dragonfly nymphs—attacks and eats them. In this game of numbers, nature's concern is for the species, not the individual. If only one in a hundred escapes these tigers of the pond, these few will keep the species in the great game of life. By midsummer the few that have somehow

***Two spring peepers** face off in the pond shallows. Choruses of these inch-long frogs are among the earliest and loudest to chant the news of spring. Individual peepers may vary in color, and females are larger than males.*

endured have largely completed their metamorphosis from tadpole to frog. They have lost their gills and developed lungs and their tails are partially absorbed, ready for living on land.

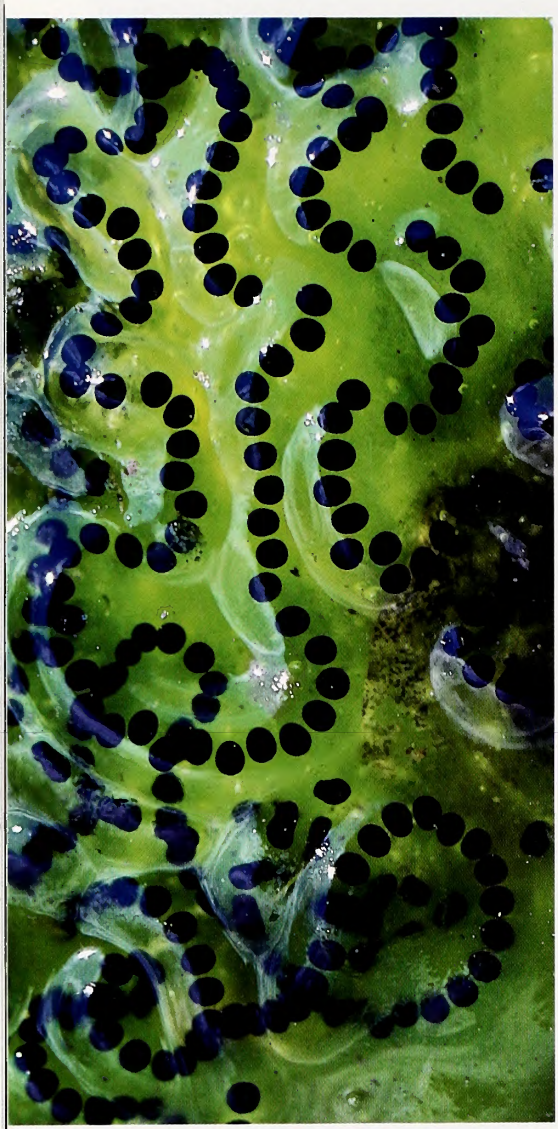
Although many of our frogs live primarily on land, they still adhere to the ancient ancestral pattern of returning to the water to lay their eggs. Their ties with it have never been broken, and it is in the water that the life cycle begins. Consider how miraculous it is: at one stage of its life, a frog is a little fish-like tadpole that swims in the water. At a later time, it lives on land with a totally different kind of body and powerful legs that can take long leaps in the air.

Many frogs have semi-aquatic habits, spending part of their time on land and part in the water, like the bullfrog (*Rana catesbeiana*) that adds its deep bass "jug-o'-rum" calls to the beauty of the night, and the green frog (*Rana clamitans*) with a voice that sounds like the twanging of a loose banjo string. Then there is the pickerel frog (*Rana palustris*), elusive and shy, that spends much of its time hiding among low-growing plants near the water, and the American toad (*Bufo americanus*) that has a musical flutelike voice.

A notable event in the pond year is the spring migration of the 6-inch spotted salamanders (*Ambystoma maculatum*) to the breeding ponds and their spectacular courtship dance rituals. On a certain rainy night, usually in early or mid-March, dozens emerge from their burrows almost simultaneously for the annual journey to the pond, which may lie a quarter of a mile away. Guided by a mysterious navigational sense, individuals of both sexes reach the pond, which is soon filled with milling black-and-yellow bodies, performing a kind of nose-rubbing aquatic ballet, making the water churn and boil by their activity. After mating is over, the females deposit their eggs in compact globular clusters, surrounded by jelly-like gelatinous envelopes. As hatching time nears, the transparent eggs show the little embryo salamanders curled up inside like tiny quarter moons. The adults leave the pond as silently as they came and return to their underground burrows, where they will not be seen by human eyes until the procreative urge of another spring draws them forth again.

By mid-May the pond is teeming with

***A green darner dragonfly** rests on a cattail plant in a mountain pond. These large pond insects mate as they fly, the male clasping the female behind the neck with the pincers at the end of his long abdomen. They are among the most colorful flying insects around the woodland pond.*



***Eggs of the American toad*** *are laid in jelly-like, transparent masses among green algae in woodland ponds. Toads may lay up to 6,000 eggs apiece. Depending on water temperature, the eggs may hatch in about four days.*

insect life, both under the water and in the air above. There are back swimmers and water boatmen that stalk their prey among the tangled roots and stems of underwater plants, and *Dytiscus* diving beetles that capture creatures many times their own size. Before submerging they enclose themselves in silvery bubbles of air, like divers taking down compressed air in Aqua Lungs. On the surface, whirligig beetles spin about in interlacing circles and water striders skate over the pond, their feet dimpling, but not breaking through, the surface film. In the water are millions of mosquito larvae that breathe oxygen from the air by means of respiratory siphons extended through the surface film. As development from egg to mature adult requires only a few days, mosquitoes often multiply out of all proportion around ponds, rising in tormenting clouds.

Many aquatic insects lead double lives, with most of their existence spent underwater as nymphs or larvae but emerging from the water as winged adults to mate, lay eggs, and spend a brief time in the sunlight before they die. Mayflies, that so allure the philosophers with the briefness of their existence, live only a few hours or, at most, two or three days. Some species rise from the water, mate in midair, lay their eggs, and, with their destinies fulfilled, die on the same day that their adult lives began.

Iridescent-bodied damselflies patrol the edges of the pond, and dragonflies of many kinds and colors zoom over the water, capturing flying insects and contributing immensely to the control of mosquitoes.

Adult caddisflies are delicate moth-like insects that fold their wings tent-like over their backs. Soon after hatching from an egg laid in the water, the grub-like larva starts building around itself a kind of house or protective case, each different species constructing its own characteristic kind. Just by looking at a case, an expert can identify the species that made it. One species uses small sticks placed lengthwise and fastened together with silk; another places the sticks crosswise, log-cabin style; yet another species selects small pebbles of a specific size and joins them edge to edge. All are skillfully constructed works of insect art. With the forepart of their bodies extending from the cases, they drag them along over the bottom of the pond, and, when threatened by an enemy, withdraw completely inside.

Living around ponds are several species of fishing spiders (*Dolomedes*). They can run over the water as gracefully as water striders or dive beneath its surface to capture aquatic insects, tadpoles or tiny fish, sometimes remaining submerged for as long as 30 minutes. Late autumn marks the close of the pond year. The frosts come, the leaves fall, the cold advances and ice slowly covers the pond. Before the advent of ice and snow,

# Big Game Tag Report - Number 16

## *...a summary of North Carolina's big game harvest for 1991-92 as reported by hunters to Wildlife Cooperator Agents*

Why should a hunter go out of his way to tag and report the turkey gobbler he just shot? How many deer were harvested during the season here in North Carolina? Was the total deer harvest for this period greater or less than this figure for last season? How is this information used? These are questions that often surface during discussions of North Carolina's big game tagging system. The big game tagging system is a reporting procedure which requires that all wild turkey, boar, bear and deer which are harvested by hunters here in the state be tagged at the site of harvest and that certain information be reported to any one of approximately 1,500 Wildlife Cooperator Agents for later collection by the Wildlife Resources Commission. This procedure became mandatory in the fall of 1976. Successful game management is based on many factors and individual pieces of information, including in this case, big game harvest figures. The more a game manager knows about population trends and numbers, the easier it is for him to make decisions affecting seasons or other regulatory matters. Sound big game management must be the result of the combined efforts of sportsmen and the staff of the Wildlife Commission. While the figures in this report represent the reported harvest and may vary from the actual harvest, they are the best such figures available at this time. Please do your share to see that future reports of this nature are as complete as possible by tagging and reporting your big game harvests and by encouraging your fellow sportsmen to do the same.

If you have questions about the procedures or this report, please contact the Division of Wildlife Management, North Carolina Wildlife Resources Commission, 512 N. Salisbury Street, Archdale Building, Raleigh, North Carolina 27604-1188.

### 1991-92 Reported Black Bear Harvest

| County | Male | Female | Unknown | Total | Game Land | Other Land | Rifle | Shot Gun | Hand Gun | Bow |
|---|---|---|---|---|---|---|---|---|---|---|
| Avery | 2 | | | 2 | 1 | 1 | 1 | | 1 | |
| Beaufort | 19 | 27 | | 46 | | 46 | 45 | | | |
| Bertie | 9 | 1 | | 10 | | 10 | 6 | 4 | | |
| Bladen | 10 | 12 | | 22 | | 22 | 14 | 8 | | |
| Brunswick | 10 | 4 | 1 | 15 | | 15 | 6 | 7 | 2 | |
| Buncombe | 8 | 7 | | 15 | 7 | 8 | 12 | 3 | | |
| Burke | 3 | 1 | | 4 | 4 | | 3 | 1 | | |
| Caldwell | 4 | 2 | | 6 | 3 | 3 | 4 | 2 | | |
| Camden | 5 | 4 | 1 | 10 | | 10 | 9 | 1 | | |
| Carteret | 10 | 7 | | 17 | 3 | 14 | 15 | 1 | 1 | |
| Cherokee | 14 | 16 | | 30 | 26 | 4 | 22 | 5 | 3 | |
| Chowan | 4 | 3 | | 7 | | 7 | 3 | 3 | 1 | |
| Clay | 16 | 10 | 1 | 27 | 14 | 13 | 25 | | | |
| Columbus | 5 | 7 | | 12 | | 12 | 6 | 3 | 3 | |
| Craven | 9 | 10 | | 19 | 1 | 18 | 17 | 1 | | |
| Cumberland | 4 | 2 | | 6 | | 6 | 3 | 3 | | |
| Dare | 1 | | | 1 | | 1 | | | | 1 |
| Duplin | 1 | 1 | | 2 | | 2 | 1 | 1 | | |
| Gates | 11 | 8 | | 19 | | 19 | 6 | 12 | | |
| Graham | 21 | 19 | | 39 | 37 | 2 | 37 | | 1 | |
| Haywood | 19 | 9 | | 28 | 24 | 4 | 24 | 2 | | |
| Henderson | 2 | 1 | | 3 | 1 | 2 | 3 | | | |
| Hyde | 39 | 33 | 2 | 74 | | 74 | 68 | 2 | 1 | |
| Jackson | 4 | 3 | | 7 | 6 | 1 | 7 | | | |
| Jones | 16 | 19 | | 35 | 10 | 25 | 32 | 1 | | |
| Macon | 25 | 7 | | 32 | 30 | 2 | 32 | | | |
| Madison | 14 | 4 | 1 | 19 | 17 | 2 | 17 | | | |
| McDowell | 21 | 18 | | 39 | 29 | 10 | 35 | 2 | 1 | 1 |
| Onslow | 11 | 7 | | 18 | | 18 | 13 | 5 | | |
| Pamlico | 12 | 6 | | 18 | 1 | 17 | 16 | 1 | | 1 |
| Pasquotank | 2 | 4 | | 6 | | 6 | 2 | 4 | | |
| Pender | 18 | 12 | | 30 | 3 | 27 | 18 | 6 | 3 | |
| Rutherford | 1 | | | 1 | | 1 | 1 | | | |
| Sampson | 3 | 1 | | 4 | | 4 | 2 | | 1 | |
| Swain | 4 | 2 | | 6 | 4 | 2 | 6 | | | |
| Transylvania | 1 | 1 | | 2 | 1 | 1 | 2 | | | |
| Tyrrell | 30 | 8 | 1 | 39 | | 39 | 36 | 3 | | |
| Washington | 6 | 14 | | 21 | | 21 | 13 | 3 | | 1 |
| Watauga | 1 | | | 1 | | 1 | 1 | | | |
| Yancey | 18 | 5 | | 23 | 4 | 19 | 15 | 6 | | 1 |
| **Totals** | 412 | 296 | 7 | 715 | 227 | 488 | 579 | 90 | 18 | 5 |

## 1990-91 Reported White-Tailed Deer Harvest

| County | Sex Harvested | | | | Antlered Bucks Per Sq. Mile | Weapon | | | | | Location | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Antlered Bucks | Button Bucks | Does | Total | | Shotgun | Rifle | Muzzle-Loader | Bow | Hand-gun | Game Lands | Other Lands |
| Alamance | 585 | 49 | 187 | 821 | 2.95 | 59 | 436 | 228 | 78 | 6 | | 821 |
| Alexander | 298 | 22 | 89 | 409 | 1.90 | 12 | 223 | 83 | 87 | 1 | 2 | 407 |
| Alleghany | 748 | 87 | 240 | 1,075 | 6.13 | 17 | 512 | 278 | 252 | 1 | 3 | 1,072 |
| Anson | 1,323 | 226 | 854 | 2,403 | 3.41 | 304 | 1,420 | 444 | 193 | 8 | 37 | 2,366 |
| Ashe | 732 | 85 | 269 | 1,086 | 2.78 | 7 | 464 | 317 | 280 | 5 | 23 | 1,063 |
| Avery | 98 | 17 | 18 | 133 | 0.53 | 2 | 101 | 15 | 14 | | 94 | 39 |
| Beaufort | 1,482 | 188 | 867 | 2,537 | 2.92 | 182 | 2,187 | 66 | 25 | 5 | 27 | 2,510 |
| Bertie | 1,549 | 269 | 1,280 | 3,098 | 3.14 | 1,801 | 1,115 | 89 | 33 | 3 | 63 | 3,035 |
| Bladen | 2,390 | 351 | 1,888 | 4,629 | 3.65 | 2,608 | 1,747 | 111 | 79 | 8 | 128 | 4,501 |
| Brunswick | 1,622 | 154 | 843 | 2,619 | 2.55 | 1,842 | 568 | 86 | 33 | 6 | 31 | 2,588 |
| Buncombe | 231 | 37 | 136 | 404 | 0.54 | 9 | 337 | 22 | 25 | 2 | 89 | 315 |
| Burke | 926 | 60 | 290 | 1,276 | 2.33 | 35 | 918 | 136 | 171 | 3 | 278 | 998 |
| Cabarrus | 116 | 6 | 22 | 144 | 0.69 | 90 | 5 | 29 | 18 | 1 | | 144 |
| Caldwell | 553 | 36 | 89 | 678 | 1.52 | 27 | 501 | 51 | 90 | 1 | 224 | 454 |
| Camden | 213 | 18 | 51 | 282 | 1.53 | 128 | 142 | 2 | 2 | | | 282 |
| Carteret | 412 | 16 | 161 | 589 | 1.51 | 210 | 321 | 35 | 13 | 1 | 78 | 511 |
| Caswell | 1,236 | 206 | 613 | 2,055 | 4.79 | 540 | 841 | 466 | 188 | 4 | 182 | 1,873 |
| Catawba | 275 | 22 | 94 | 391 | 1.53 | 13 | 184 | 90 | 89 | 1 | 1 | 390 |
| Chatham | 1,726 | 167 | 722 | 2,615 | 3.66 | 172 | 1,299 | 671 | 440 | 7 | 337 | 2,278 |
| Cherokee | 27 | | 1 | 28 | 0.07 | 3 | 23 | | 1 | | 23 | 5 |
| Chowan | 444 | 41 | 282 | 767 | 5.29 | 235 | 463 | 25 | 24 | 2 | 3 | 764 |
| Clay | 94 | | 8 | 102 | 0.55 | 3 | 85 | 3 | 10 | | 79 | 23 |
| Cleveland | 307 | 22 | 62 | 391 | 1.41 | 16 | 299 | 32 | 33 | 2 | 3 | 388 |
| Columbus | 1,866 | 187 | 1,014 | 3,067 | 2.83 | 1,887 | 948 | 100 | 45 | 4 | | 3,067 |
| Craven | 1,410 | 118 | 723 | 2,251 | 2.80 | 359 | 1,660 | 122 | 50 | 6 | 90 | 2,161 |
| Cumberland | 773 | 75 | 433 | 1,281 | 2.12 | 227 | 916 | 51 | 80 | 1 | | 1,281 |
| Currituck | 436 | 55 | 177 | 668 | 4.32 | 262 | 364 | 11 | 17 | | 17 | 651 |
| Dare | 123 | 9 | 30 | 162 | 0.49 | 56 | 50 | 44 | 11 | 1 | 114 | 48 |
| Davidson | 477 | 48 | 185 | 710 | 1.68 | 33 | 447 | 140 | 80 | | 22 | 688 |
| Davie | 455 | 34 | 150 | 639 | 3.86 | 45 | 311 | 166 | 106 | 2 | 8 | 631 |
| Duplin | 1,189 | 101 | 445 | 1,735 | 2.61 | 601 | 1,026 | 39 | 22 | 2 | 8 | 1,727 |
| Durham | 253 | 14 | 95 | 362 | 1.79 | 128 | 124 | 74 | 34 | | 147 | 215 |
| Edgecombe | 1,498 | 241 | 1,171 | 2,910 | 6.43 | 910 | 1,721 | 108 | 66 | 17 | | 2,910 |
| Forsyth | 94 | 4 | 11 | 109 | 0.53 | 2 | 67 | 22 | 18 | | | 109 |
| Franklin | 1,105 | 114 | 505 | 1,724 | 3.71 | 925 | 626 | 60 | 52 | 9 | 10 | 1,714 |
| Gaston | 61 | 1 | 8 | 70 | 0.34 | 9 | 33 | 10 | 18 | | | 70 |
| Gates | 1,014 | 268 | 1,005 | 2,287 | 4.19 | 1,846 | 309 | 52 | 25 | 12 | 19 | 2,268 |
| Graham | 37 | | 1 | 38 | 0.13 | | 33 | 1 | 4 | | 29 | 9 |
| Granville | 1,086 | 115 | 468 | 1,669 | 3.09 | 423 | 739 | 308 | 186 | 2 | 132 | 1,537 |
| Greene | 244 | 7 | 34 | 285 | 2.00 | 118 | 142 | 7 | 5 | | | 285 |
| Guilford | 303 | 32 | 85 | 420 | 1.17 | 61 | 201 | 103 | 49 | 1 | | 420 |
| Halifax | 2,112 | 419 | 1,790 | 4,321 | 4.79 | 1,420 | 2,576 | 141 | 65 | 11 | 16 | 4,305 |
| Harnett | 254 | 7 | 47 | 308 | 0.73 | 151 | 85 | 28 | 38 | | | 308 |
| Haywood | 161 | 12 | 59 | 232 | 0.38 | 1 | 192 | 8 | 27 | 1 | 213 | 19 |
| Henderson | 182 | 14 | 34 | 230 | 0.77 | 5 | 168 | 18 | 30 | | 99 | 131 |
| Hertford | 611 | 127 | 495 | 1,233 | 2.66 | 873 | 311 | 17 | 2 | 3 | | 1,233 |
| Hoke | 172 | 6 | 15 | 193 | 0.67 | 129 | 47 | 5 | 8 | 1 | 2 | 191 |
| Hyde | 1,055 | 170 | 814 | 2,039 | 2.87 | 343 | 1,311 | 207 | 114 | 5 | 115 | 1,924 |
| Iredell | 769 | 48 | 241 | 1,058 | 3.03 | 52 | 571 | 229 | 176 | | 2 | 1,056 |
| Jackson | 10 | 1 | 1 | 12 | 0.02 | 1 | 10 | | 1 | | 12 | 0 |

| County | Sex Harvested | | | | Antlered Bucks Per Sq. Mile | Weapon | | | | | Location | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Antlered Bucks | Button Bucks | Does | Total | | Shotgun | Rifle | Muzzle-Loader | Bow | Hand-gun | Game Lands | Other Lands |
| Johnston | 574 | 38 | 194 | 806 | 1.53 | 128 | 522 | 41 | 98 | 4 | | 806 |
| Jones | 1,266 | 161 | 748 | 2,175 | 3.55 | 204 | 1,811 | 77 | 24 | 3 | 113 | 2,062 |
| Lee | 276 | 23 | 80 | 379 | 1.63 | 38 | 196 | 90 | 51 | | 18 | 361 |
| Lenoir | 463 | 44 | 247 | 754 | 2.36 | 103 | 611 | 12 | 13 | 1 | 4 | 750 |
| Lincoln | 137 | 3 | 12 | 152 | 0.96 | 12 | 82 | 35 | 23 | | | 152 |
| Macon | 193 | 1 | 8 | 202 | 0.44 | 2 | 180 | 6 | 12 | | 153 | 49 |
| Madison | 149 | 8 | 37 | 194 | 0.45 | 4 | 149 | 5 | 34 | | 120 | 74 |
| Martin | 1022 | 139 | 531 | 1,692 | 3.73 | 992 | 606 | 23 | 17 | | 14 | 1,678 |
| McDowell | 554 | 25 | 123 | 702 | 1.47 | 17 | 493 | 57 | 128 | 2 | 277 | 425 |
| Mecklenburg | 100 | 24 | 51 | 175 | 0.48 | 83 | 2 | 48 | 42 | | | 175 |
| Mitchell | 237 | 17 | 110 | 364 | 1.43 | 2 | 211 | 38 | 102 | | 87 | 277 |
| Montgomery | 1,392 | 235 | 637 | 2,264 | 3.47 | 189 | 1,114 | 653 | 261 | 6 | 360 | 1,904 |
| Moore | 483 | 37 | 171 | 691 | 0.92 | 391 | 184 | 66 | 44 | 2 | 14 | 677 |
| Nash | 619 | 38 | 182 | 839 | 2.20 | 335 | 463 | 13 | 9 | 2 | | 839 |
| New Hanover | 73 | 4 | 43 | 120 | 0.94 | 68 | 43 | 4 | 3 | | 2 | 118 |
| Northampton | 2,087 | 480 | 1,833 | 4,400 | 6.32 | 2,014 | 2,049 | 136 | 47 | 10 | | 4,400 |
| Onslow | 1,608 | 205 | 910 | 2723 | 2.99 | 1,541 | 882 | 75 | 136 | 6 | 58 | 2,665 |
| Orange | 712 | 60 | 270 | 1042 | 3.08 | 187 | 463 | 238 | 142 | 2 | | 1042 |
| Pamlico | 496 | 26 | 267 | 789 | 2.37 | 73 | 595 | 25 | 11 | 1 | 10 | 779 |
| Pasquotank | 203 | 12 | 52 | 267 | 2.60 | 103 | 147 | 5 | 1 | 1 | | 267 |
| Pender | 1,835 | 211 | 1,084 | 3,130 | 2.56 | 1,214 | 1,635 | 106 | 74 | 12 | 73 | 3,057 |
| Perquimans | 547 | 82 | 390 | 1,019 | 4.60 | 359 | 615 | 14 | 13 | 3 | | 1,019 |
| Person | 699 | 88 | 323 | 1,110 | 2.99 | 391 | 449 | 197 | 57 | 3 | 36 | 1,074 |
| Pitt | 972 | 83 | 361 | 1,416 | 2.99 | 214 | 1,108 | 32 | 20 | 6 | | 1,416 |
| Polk | 202 | 14 | 58 | 274 | 1.09 | 10 | 201 | 15 | 45 | | 94 | 180 |
| Randolph | 537 | 57 | 128 | 722 | 1.08 | 46 | 424 | 149 | 99 | 2 | 28 | 694 |
| Richmond | 772 | 104 | 399 | 1,275 | 2.08 | 649 | 504 | 76 | 27 | | 81 | 1,194 |
| Robeson | 595 | 44 | 257 | 896 | 1.36 | 515 | 322 | 26 | 13 | 3 | 8 | 888 |
| Rockingham | 788 | 80 | 277 | 1,145 | 2.42 | 117 | 540 | 223 | 251 | 3 | | 1,145 |
| Rowan | 528 | 70 | 192 | 790 | 2.25 | 61 | 450 | 162 | 109 | 1 | 40 | 750 |
| Rutherford | 799 | 43 | 250 | 1,092 | 1.91 | 27 | 837 | 83 | 121 | 4 | 59 | 1,033 |
| Sampson | 1,124 | 127 | 678 | 1,929 | 2.13 | 719 | 1,069 | 43 | 43 | 3 | | 1,929 |
| Scotland | 514 | 44 | 181 | 739 | 2.68 | 475 | 188 | 17 | 47 | 1 | 132 | 607 |
| Stanly | 626 | 87 | 339 | 1,052 | 3.44 | 96 | 576 | 198 | 159 | 5 | 6 | 1,046 |
| Stokes | 163 | 13 | 38 | 214 | 0.55 | 12 | 114 | 41 | 43 | 1 | 2 | 212 |
| Surry | 366 | 16 | 78 | 460 | 1.21 | 21 | 283 | 102 | 46 | | | 460 |
| Swain | 27 | 1 | | 28 | 0.06 | 5 | 20 | 1 | 2 | | 11 | 17 |
| Transylvania | 179 | 1 | 18 | 198 | 0.54 | | 165 | 6 | 17 | | 128 | 70 |
| Tyrrell | 327 | 16 | 82 | 425 | 1.37 | 27 | 318 | 47 | 18 | 2 | 1 | 424 |
| Union | 180 | 4 | 2 | 186 | 0.65 | 15 | 140 | 21 | 4 | 2 | | 186 |
| Vance | 527 | 26 | 158 | 711 | 3.29 | 248 | 381 | 40 | 31 | 2 | 8 | 703 |
| Wake | 463 | 31 | 109 | 603 | 1.18 | 123 | 350 | 58 | 61 | 2 | 122 | 481 |
| Warren | 1,214 | 225 | 747 | 2,186 | 3.98 | 1,226 | 822 | 65 | 21 | 4 | | 2,186 |
| Washington | 530 | 53 | 227 | 810 | 3.66 | 116 | 526 | 96 | 41 | | 2 | 808 |
| Watauga | 171 | 6 | 15 | 192 | 0.81 | 2 | 120 | 27 | 41 | 1 | 5 | 187 |
| Wayne | 204 | 14 | 78 | 296 | 0.90 | 53 | 218 | 15 | 4 | 2 | | 296 |
| Wilkes | 1,275 | 66 | 280 | 1,621 | 2.28 | 12 | 884 | 403 | 294 | 4 | 67 | 1,554 |
| Wilson | 87 | 3 | 12 | 102 | 0.55 | 44 | 54 | | 4 | | | 102 |
| Yadkin | 400 | 14 | 33 | 447 | 2.78 | 15 | 245 | 100 | 84 | | | 447 |
| Yancey | 292 | 20 | 95 | 407 | 1.15 | 9 | 191 | 43 | 161 | | 115 | 292 |
| **State Total** | 64,735 | 7,530 | 32,511 | 104,776 | 2.15 | 32,501 | 53,743 | 9,413 | 6,655 | 251 | 5,008 | 99,768 |

## 1991 - 92 Reported Wild Boar Harvest

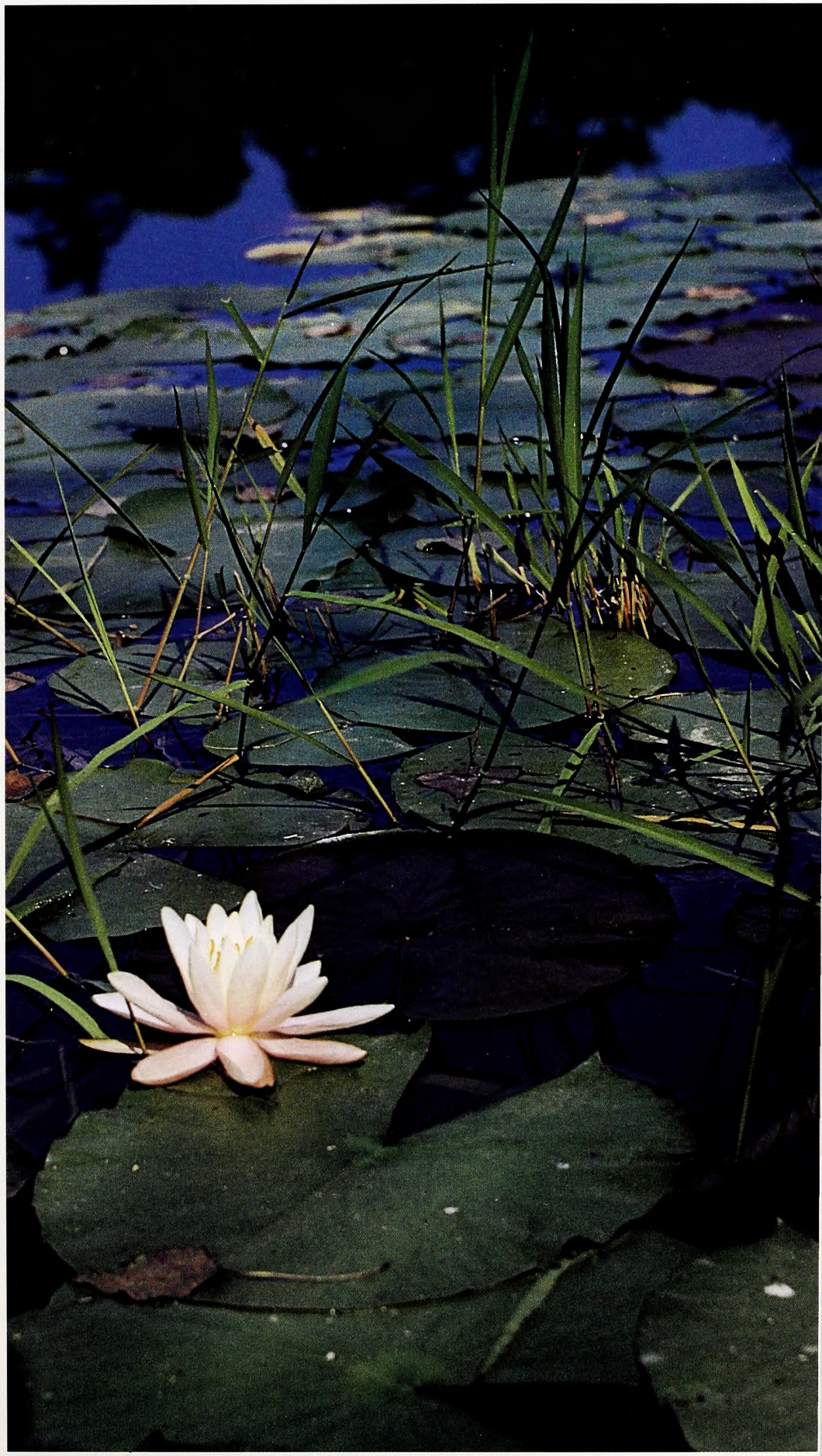
| County | Male | Female | Total | Game Land | Other Land | Unk. Land | Rifle | Shot Gun | Hand Gun | Bow | Unk. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Burke | 1 | | 1 | | 1 | | 1 | | | | |
| Cherokee | 13 | 18 | 31 | 25 | 5 | 1 | 18 | 13 | | | |
| Clay | 3 | 9 | 12 | 8 | 3 | 1 | 10 | 1 | | | 1 |
| Cleveland | 2 | 1 | 3 | 2 | 1 | | 3 | | | | |
| Graham | 15 | 21 | 36 | 33 | 3 | | 30 | 6 | | | |
| Henderson | | 1 | 1 | | 1 | | 1 | | | | |
| Jackson | | 1 | 1 | | | 1 | | | | | 1 |
| Macon | 3 | 1 | 4 | 3 | 1 | | 4 | | | | |
| Swain | 1 | 2 | 3 | | 3 | | 2 | 1 | | | |
| Totals | 38 | 54 | 92 | 71 | 18 | 3 | 69 | 21 | | | 2 |

## 1991 Reported Wild Turkey Harvest

| | Age | | | | Location | | | Weapon Used | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| County | Adult | Juvenile | Unk. | Total Reported | Game Land | Other Land | Unk. Land | Shotgun | Bow | Muzzle | Unk. |
| Alamance | 30 | 3 | | 33 | | 33 | | 33 | | | |
| Alleghany | 101 | 50 | 1 | 152 | | 152 | | 146 | 2 | | 4 |
| Anson | 8 | 5 | | 13 | | 12 | 1 | 12 | | 1 | |
| Ashe | 137 | 49 | 3 | 189 | 2 | 169 | 18 | 183 | | | 6 |
| Bertie | 64 | 13 | 2 | 79 | 2 | 64 | 13 | 77 | | | 2 |
| Buncombe | 25 | 4 | | 29 | 12 | 15 | 2 | 27 | | | 2 |
| Burke | 2 | 1 | | 3 | 3 | | | 3 | | | |
| Caldwell | 1 | | | 1 | | 1 | | 1 | | | |
| Caswell | 253 | 29 | 4 | 286 | 29 | 240 | 17 | 275 | | | 11 |
| Chatham | 13 | | | 13 | 5 | 5 | 3 | 12 | | | 1 |
| Cherokee | 65 | 8 | | 73 | 51 | 14 | 8 | 72 | | | 1 |
| Clay | 24 | | 1 | 25 | 16 | 8 | 1 | 25 | | | |
| Columbus | 2 | | | 2 | | 2 | | 2 | | | |
| Craven | 1 | | | 1 | 1 | | | 1 | | | |
| Durham | 5 | | | 5 | | 4 | 1 | 4 | | | 1 |
| Graham | 47 | 1 | | 48 | 42 | 5 | 1 | 46 | | | 2 |
| Granville | 26 | | 1 | 27 | 3 | 23 | 1 | 27 | | | |
| Halifax | 27 | 8 | | 35 | | 30 | 5 | 35 | | | |
| Haywood | 29 | 5 | | 34 | 24 | 10 | | 33 | | 1 | |
| Henderson | 27 | 10 | | 37 | 20 | 10 | 7 | 36 | 1 | | |
| Hyde | 5 | 1 | | 6 | | 6 | | 6 | | | |
| Jackson | 15 | 4 | | 19 | 14 | 5 | | 19 | | | |
| Johnston | 7 | | | 7 | | 7 | | 7 | | | |
| Macon | 62 | 3 | | 65 | 49 | 9 | 7 | 64 | 1 | | |
| Madison | 25 | | | 25 | 13 | 10 | 2 | 25 | | | |
| Martin | 26 | 1 | | 27 | 1 | 23 | 3 | 27 | | | |
| McDowell | 10 | 4 | | 14 | 11 | 2 | 1 | 13 | | | 1 |
| Mitchell | 9 | 6 | | 15 | 10 | 4 | 1 | 13 | | | 2 |
| Montgomery | 26 | 6 | | 32 | 4 | 27 | 1 | 30 | | | 2 |
| Moore | 1 | 1 | | 2 | 2 | | | 2 | | | |
| Northampton | 36 | 3 | | 39 | | 35 | 4 | 39 | | | |
| Onslow | 15 | 4 | | 19 | | 19 | | 19 | | | |
| Orange | 41 | 3 | | 44 | | 34 | 10 | 42 | | | 2 |
| Pender | 4 | | | 4 | | 4 | | 4 | | | |
| Person | 108 | 10 | | 118 | 5 | 91 | 22 | 110 | | | 8 |
| Richmond | 54 | 6 | | 60 | 4 | 52 | 4 | 59 | | | 1 |
| Robeson | 1 | | | 1 | | 1 | | 1 | | | |
| Rockingham | 27 | 3 | | 30 | | 30 | | 29 | | | 1 |
| Scotland | 7 | | | 7 | 3 | 4 | | 6 | | | 1 |
| Surry | 25 | 10 | 1 | 36 | | 36 | | 33 | | | 3 |
| Swain | 22 | 1 | | 23 | 10 | 12 | 1 | 21 | | | 2 |
| Transylvania | 26 | 3 | | 29 | 18 | 7 | 4 | 29 | | | |
| Watauga | 44 | 12 | | 56 | 3 | 50 | 3 | 54 | | | 2 |
| Wilkes | 28 | 17 | | 45 | 4 | 37 | 4 | 44 | | | 1 |
| Yancey | 9 | 1 | | 10 | 4 | 5 | 1 | 9 | | | 1 |
| Totals | 1,520 | 286 | 12 | 1,818 | 366 | 1,304 | 148 | 1,755 | 4 | 2 | 57 |

Previous Five Years Harvests: 1986-540; 1987-680; 1988-1,032; 1989-1,275; and 1990-1,534.

1,000 copies of this public document were printed at a cost of $50.00 or $.05 per copy.



**Colorful red salamander** *(above) can be found on the wet margins of a woodland pond. These amphibians mate in summer and spawn in October, with the eggs hatching in early December. Water lilies (right) grace the surface of woodland ponds, providing hiding places for many small pond creatures.*

frogs and hundreds of other creatures have descended into the death-like sleep of hibernation, nature's miraculous means of enabling animals to cope with freezing temperatures and a decreasing food supply. Wood frogs hibernate beneath old logs or bury deep in the loam of the forest floor. All the other frogs plunge beneath the chilly waters and bury themselves in the mud of the pond bottom, and so do the turtles. Most of the adult insects perish in the cold, but leave eggs behind, from which new generations will arise.

To the pond's inhabitants, winter brings the harshest trials of all the seasons, but the story does not end here, for, slowly but surely, the inevitable wheel of the seasons is turning. To a hibernating animal, winter passes like a single night. The months go by as winter stretches sweetly into spring, and the pond comes to life again in all its action, color and amazing diversity. ⊠

# Echoes on Old Battlegrounds

The sites of Civil War encounters in North Carolina have rested in tranquil peace for nearly 130 years, occupied mostly by wildlife, but now many of them face an uncertain future.

written and photographed by Vic Venters

*Wyse Fork Battlefield, Kinston*

It was at a weathered lump of leaf-covered dirt, scarcely distinguishable in the vine-choked ravine where we stood, that the past and present became one in my mind's eye, and the guns once again sounded.

Under my feet lay the weathered remains of a Confederate rifle pit, a Civil War version of the modern foxhole. To the left, up and out of the ravine and 100 yards into the plowed field, was the shallow ridge where dug-in Federal troops would have massed on March 9, 1865, waiting for the expected Confederate charge. This rifle pit, however, would have been far in front of main Confederate lines; this exposed man's task was to snipe at and harass the Federal troops who stood perhaps a football-field length away.

The soldier had apparently done his job well. "I dug a 100 or more Minie balls from the face of this pit," said Donny Taylor, owner of the property and a local expert on the Battle of Wyse Fork. The Minie balls—rifled bullets—had been fired at someone in this very pit. "I don't know what he was doing but he was sure making some Yankees awfully mad."

Indeed, this little affair seemed to have been personal. For these were not 100 random shots sprayed across the landscape but were bullets specifically aimed to kill the one soldier who lay sheltered behind his tiny sanctuary of Carolina earth on that day 127 years ago. Who was this man, I wondered, who drew the deadly ire of so many Yankee troops?

Was it a Confederate sharpshooter whose telling fire attracted this angry attention? Or was it perhaps a boasting rebel soldier, whose defiant taunts infuriated the men he was facing? Had he survived the fusillade of lead? Or had one of those bullets found its mark, adding this unknown Johnny Reb to the 1,000 or so men in blue and gray who fell on this all but forgotten field of death?

Along with Donny Taylor, I was accompanied by John C. Goode, site manager for the Bentonville Battleground State Historic Site. The pair, both experts on the little-known Wyse Fork encounter, were mapping the battleground as part of federally commissioned Civil War battlefield survey. We had spent the day locating surviving trenches, redoubts, battle lines, old roads, troop movement routes, hospitals and headquarters.

Until that moment, I had been an interested observer, but little more. But as we stood at the pit and Donny spoke of the battle, I found myself almost there. I could almost see the smoke and fire, hear the screams and shouts, see this lone man hurling death up the ridge and dodging it in return. Then I shook my head.

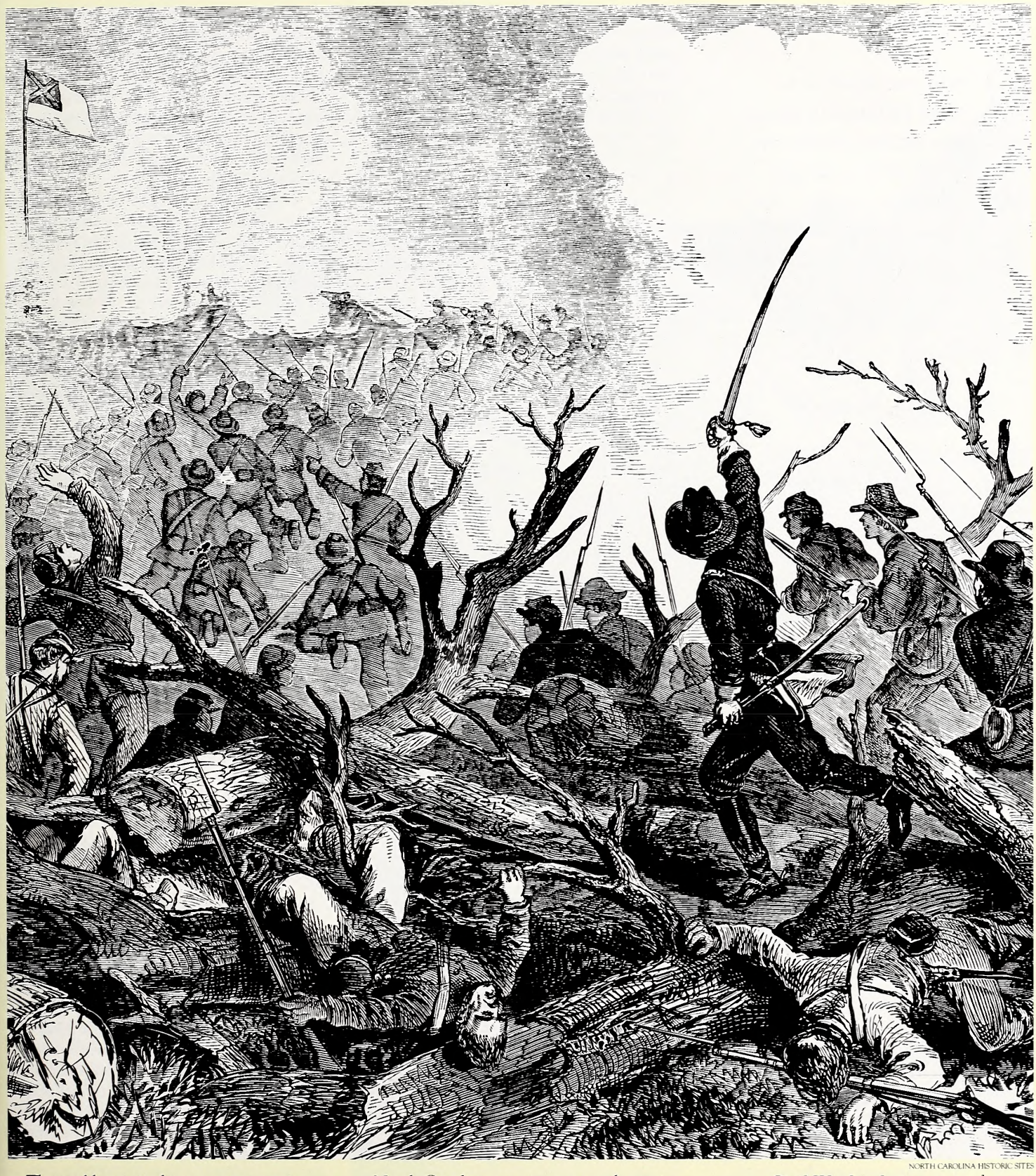
Glorious? No. *Terrible.*

My sudden connection with the past at Wyse Fork may explain why so many Americans occasionally tramp across our old battlefields, scanning the landscape not merely with the casual gaze of a tourist but through the probing eyes of a would-be participant. Seen from this perspective, the very existence of these United States, so often taken for granted, may be experienced as a precious gift to modern Americans. These battlefields are also reminders that this gift came at the dearest cost of all—by more than 630,000 lives on both sides in the Civil War alone.

These once-bloody sites, where the future of slavery and our nation was decided, are our telegraph wires to the past, to what Abraham Lincoln called "the mystic chords of memory, stretching from every battlefield and patriot grave to every living heart and hearthstone all over this broad land." War so terrible should never be hailed as grand and glorious but, likewise, should never be forgotten.

Increasingly, however, this part of our history is quickly being forgotten as we erect shopping malls and fast food restaurants, not monuments, on these hallowed fields. The same forces that most threaten North America's wildlife habitat—urban sprawl and development—also march inexorably over battle sites, and the war is today being fought not with musket and saber, but with bulldozers and building permits.

As we enter the 1990s, the integrity of many, and perhaps most, of America's Civil War battle sites is considered threatened. "The next five years," predicts the Civil War Battlefield Foundation, "are critical to battlefield preservation as it is predicted that many, even most, of our most important Civil War battle sites could be lost forever to development within this time period." Of the 10,500 battles and skirmishes in the war, only 31 battlefields are currently protected and administered by the National Park Service. Even with that small number, usually only portions of the battlefields are protected. Individual states also protect some battlegrounds as historic sites, but their holdings represent only a fraction of the war's engagements.



NORTH CAROLINA HISTORIC SITES

***Civil War battlesites** across the nation, including those in North Carolina, are once again becoming arenas of potential conflict as development pressures and preservation efforts collide.*

The problem is perhaps most severe in states like Virginia, especially in the corridor between Richmond and Washington, where the bloodiest fighting of the war occurred. Many battle sites have long been paved over, while others, such as Brandy Station, the site of the largest cavalry battle of the war, are being destroyed as you read this article.

North Carolina was never ground to epic conflicts like Antietam and Gettysburg, but was nonetheless a heavily fought-over state. There were 11 battles and 74 smaller engagements fought in all three regions of the state, ranging from cavalry raids in the mountains to the Battle of Bentonville, where 90,000 men clashed and where 4,500 men were killed

*"These once bloody sites, where the future of slavery and our nation were decided, are our telegraph wires to the past, to what Abraham Lincoln called 'the mystic cords of memory, stretching from every battlefield and patriot grave to every living heart and hearthstone all over this broad land.'"*

or wounded.

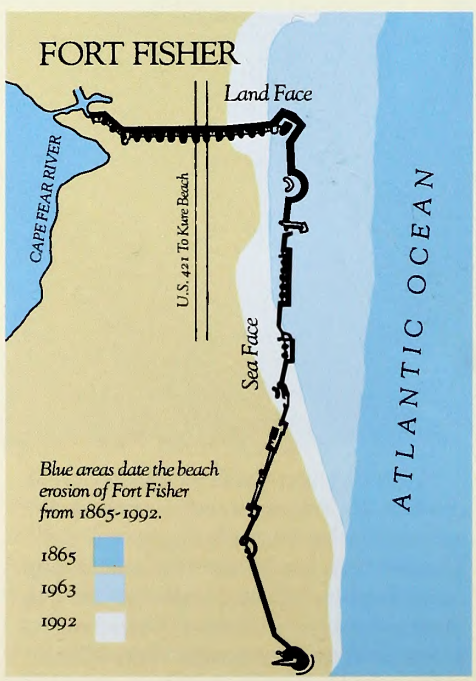
In North Carolina, there are six Civil War sites managed by the N.C. Department of Cultural Resources: Fort Fisher in New Hanover County, the giant earthen fort that guarded the blockade runner port of Wilmington; Fort Anderson at Brunswick, another earthen fort that was part of Wilmington's Cape Fear River defenses; Bennett Place in Durham County, a reconstructed farm house where Gen. Joe Johnston surrendered the armies of the Carolinas and Georgia to Gen. William T. Sherman in 1865; the C.S.S. *Neuse* at Kinston, the hull of a Confederate ironclad; about 100 acres at Bentonville Battleground, site of the largest land battle in North Carolina; Vance Birthplace, where Civil War Gov. Zebulon B. Vance was born. A seventh site—Fort Macon near Beaufort Inlet—is managed by the N.C. Division of Parks and Receation.

As North Carolina experiences rapid population growth, its other Civil War battlefields, all located on private lands, are now coming under increasing development pressures. In the war, battles were often fought at or around strategic junctures: important towns, railroad depots, ports, travel corridors and high ground. The same factors that attracted the generals and their men 125 years ago now attract the forces of growth and economic expansion today. For instance, many of the engagement sites dating from the 1865 Campaign for Wilmington are now paved over, and important battlegrounds and forts around New Bern, Kinston and Goldsboro may be only few years from concrete oblivion.

Overall, it's a somewhat bleak picture but, fortunately, not a lost cause. Many believe there's room for an "honorable peace" between the camps of historic preservation and economic progress. This cause for optimism began in 1988, when a shopping mall developer targeted a 542-acre tract adjacent to National Park Service land at the Manassas Battleground in northern Virginia. The parcel, which encompassed General Robert E. Lee's headquarters during the second 1862 battle, seemed doomed. However, after a bitter struggle, battlefield-preservation forces were able to mobilize a groundswell of public support to persuade Congress to save the site. Congress authorized funds to purchase the tract, but the federal government was forced to pay over $250,000 per acre to the developer to obtain it.

Dubbed the "Third Battle of Manassas," the purchase is now considered a turning point in Civil War preservation efforts. It proved there was broad public support for preserving important battle sites. It also showed that paying exorbitant prices for land was not the best way to preserve an important site. In an era of empty government coffers, the nation could not routinely afford such expenditures, however consequential the site. Clearly, a pro-active, rather than reactive, preservation strategy was called for.

In response to the Manassas fiasco, the Secretary of the U.S. Department of the Interior, Manuel Lujan, moved in 1990 to implement the American Battlefield Protection Program, a strategy designed to safeguard important battlesites before they became critically threatened. In short, the program proposes cooperative partnerships among federal, state and local governments, private organizations and landowners that would protect battlefields through a wide variety of strategies, including purchase, conservation or scenic easements, voluntary agreements and historic landmark designation. Twenty-five battle sites in 14 states were identified as being in imminent danger and were placed on a priority protection list needing immediate attention. Fort Fisher in New Hanover County was the sole inclusion in North Carolina.




To stress the cooperative private/public partnerships, the program also helped establish the Civil War Battlefield Foundation in 1991. The foundation, a non-profit organization, has set an initial goal of raising $100 million to preserve the 25 priority-listed battlefields. With a board of directors that includes notables from the private sector as well as Civil War historians and historic preservationists, the foundation will be cooperating with other preservation groups such as The Conservation Fund and the Association for the Preservation of Civil War Sites.

The third leg of the broad protection strategy was the creation of the Civil War Sites Advisory Commission. The commission, administered by the National Park Service, is charged with identifying important sites, determining their significance, assessing short-term and long-term threats to site integrity, and proposing strategies for preserving important sites or sections of battlefields.

It should be emphasized that all three initiatives stress cooperation, and not confrontation, with private landowners. Both state and federal governments have neither the money nor the manpower to buy and maintain all battle sites.Given the 10,500 engagements of the war, there is simply too much private land involved for comprehensive land acquisition. Nor is anyone eager to take that much land off tax rolls. But everyone agrees that effective use of cooperative preservation agreements such as easements can be made, especially if they can be applied before rising land costs and development pressures make their application unattractive to landowners.

Preserving battlefields can make good economic sense and does not have to clash with economic progress. Properly maintained and preserved battle sites have tremendous potential for generating tourist revenues in surrounding locales. Fort Fisher, for example, is North Carolina's most popular historic site, attracting more than 150,000 visitors per year.

This spring, researchers representing the Sites Commission arrived in North Carolina and were assisted by local experts in surveying and mapping the 20 Civil War battle sites considered most significant in the state. The National Park Service is also compiling the

NORTH CAROLINA HISTORIC SITES

***While the land face*** *of Fort Fisher near the Cape Fear River remains largely intact, most of the fort's sea face has disappeared into the encroaching Atlantic Ocean. The top photo shows how a land face gun emplacement of the fort looked immediately after its capture in 1865, while the lower photo shows the restored position today.*

data from another 366 sites around the country. "These reports give a snapshot picture of the nation's most important battlefields as they appear in the spring of 1992," said Paul Hawke, a historian with the National Park Service and coordinator in the Southeast for the American Battlefield Protection Program. "With this we can analyze the data, determine what sites are most threatened, determine general trends and common threats to integrity, and come up with solutions that can be applied most efficiently on a large-scale basis."

Of the 20 sites surveyed in North Carolina, Fort Fisher poses the most unique preservation problem. As North Carolina's only priority-listed battlefield selected for assistance under the American Battlefield Protection Program, Fort Fisher faces a stormy future—quite literally. As a state-owned historic site and the state's first National Historic Landmark, the great earthen fort that guarded the blockade-running port of Wilmington remains safe from development, but not from the encroaching Atlantic Ocean.

Since a coquina rock reef was mined

*"'The next five years,' predicts the Civil War Battlefield Foundation, 'are critical to battlefield preservation as it is predicted that many, even most, of our important Civil War battle sites could be lost forever to development within this time period.'"*

off Kure Beach in the 1920s, erosion has steadily been eating away at the fort. Over 2,100 feet of the fort's sea-face and 750 feet of the land-face have disappeared beneath the Atlantic's relentless advance in the past half century. Erosion has been slowed but the remaining earthworks are considered extremely vulnerable. "If a Hugo-sized hurricane hit the area, much of Fort Fisher would probably disappear into the waves," said Paul Hawke.

With congressional support, officials with the N.C. Department of Cultural Resources and the U.S. Department of the Interior have proposed building an $8.7 million, 3,200-foot-long granite barrier to halt the erosion and to protect the fort against any storm surge. Funding would be divided equally by state and federal governments. However, the seawall proposal flies in the face of North Carolina's strict ban on seawalls and beach-hardening structures.

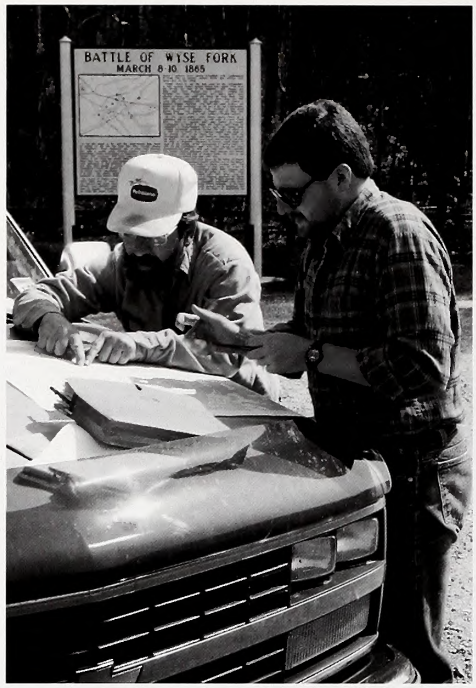
Critics contend that the seawall will increase erosion to surrounding beaches, and they point to scientific studies to back up their claims. Some environmentalists also fear that if the Division of Coastal Management—the state agency that regulates the law—grants a permit for a Fort Fisher seawall, it might open an unwelcome loophole for other seawalls to protect shorefront development.

On the other hand, Fort Fisher proponents point to the tremendous popularity of the site and to hefty tourist revenues to the local economy. Most important to many is the fact that the bitter 1865 battle for Fort Fisher was one of the war's truly decisive battles. The fort, they argue, is irreplaceable and cannot be reconstructed if washed away.

Last spring, the Department of Cultural Resources was denied a permit to build the seawall by the Division of Coastal Management. As of mid-April, Cultural Resources was appealing the decision to the Coastal Resources Commission, the panel which oversees Coastal Management. "Through normal channels, we will be requesting an expedited variance from the Coastal Resources Commission," explained James McPherson, historic sites administrator for Cultural Resources. "What that means is, that in the case of Fort Fisher, we are seeking an exception to the Coastal Resources Commission's guidelines that prohibit seawalls and beach hardening. This would allow us to build the seawall." A decision was expected in late-May.

If Fort Fisher is unique in its problems, Wyse Fork battlefield near Kinston, and the numerous battle sites and forts around New Bern, are more typical of what faces North Carolina's unprotected battlefields. In both cases, the battlefield areas remain relatively well-preserved. But for how long?

Although most of Wyse Fork's original battlefield features have long vanished in the face of the plow or development, the battle area retains what historians call "landscape integrity"—meaning that an original participant, were he plucked from the past and deposited in the modern world, could still recognize the location. Though still largely an agricultural landscape, Wyse Fork faces an uncertain future as Kinston continues to grow into the surrounding countryside.




***Under the auspices** of the National Park Service, historians and local experts surveyed 20 battle sites in North Carolina this spring as part of a nationwide inventory of important Civil War battlefields determine threats to their integrity. Historians Donna Taylor (left) and John Goode survey the Wyse Fork battlefield.*

New Bern is surrounded by numerous well-preserved earthworks and forts from the more than 20 engagements that took place around it in the war. As the home base of Union operations in North Carolina during the war, the town played a major, strategic role as a threat to Confederate rail and supply lines running to Virginia. "As a whole, New Bern has some of the best preserved and most significant sites in North Carolina that are completely unprotected," said Hawke of the National Park Service. "Some wonderful earthworks may become threatened as the city continues to grow."

Will Gorges, a local Civil War antique dealer and director of the New Bern Civil War Museum, would like to see at least one nearby site, where the Battle of New Bern took place in 1862, become a federal park. "There's a lot of local sentiment for giving the site historic landmark status and protecting some of the other sites around here," Gorges said. "Most of the intact sites are in paper company hands, so maybe there's room for negotiation. I just hope we can make some progress." Gorges and others are in the process of forming a support group to lobby for protection of New Bern sites.

At Bentonville this spring, a land donation to the state may provide a preview of how land preservation could work under the umbrella of the American Battlefield Protection Program. Bentonville saw the largest battle ever fought in North Carolina, and the landscape remains largely rural and in many ways unchanged since the battle, but the recent opening of nearby I-40 is expected to bring a flood of development to Johnston County and the battle area. Of the 6,000 acres the battle was fought on, only about 100 are protected as part of a state historic site.

In March, a local Johnston County landowner, Ross Lampe, donated a one-acre parcel, which contained battlefield trenches, to the state. The parcel had been listed for sale but was noticed by the Conservation Fund, a Virginia-based land trust active in Civil War battlefield preservation.

Although a small transfer in terms of acreage, state officials were excited about the implications of the donation. "This land deal is a model of how land preservation can work," explained John Goode, the site manager at Bentonville. "You've got a private landowner cooperating with a preservation organization and the state. We hope to apply this type of scenario to other sites at Bentonville and around the state. Extending protec-

***In a burned patch** of cleared timber, a shallow depression about 30 yards long is virtually all that remains of Union trench lines at the Wyse Fork battle site near Kinston. Most of the earthworks and trenches were plowed under long ago.*

tion doesn't have to be a donation, though. It can be as simple as an agreement between landowner or it can be a fee-purchase."

State officials are now seeking a National Historic Landmark designation for the battleground and they are attempting to work closely with local government around Bentonville. They point to the Bentonville Brigade, a private/public group charged with developing local grass-roots support that was formed this spring.

"The partnership of government and the private sector, made possible by the Bentonville Brigade, will be crucial to the preservation of the battleground," said Jim McPherson. "We don't have the money or manpower to acquire and maintain a large portion of the 6,000-acre battlefield. The partnership with the Bentonville Brigade and the Conservation Fund will allow us to use a variety of tools—smaller purchases, donations and conservation easements—to protect viewsheds and important historical resources with the support of the local landowners."

In 1862, Lincoln's Emancipation Proclamation made clear that the United States was too small for both the institutions of freedom and slavery. In 1992, it will be our challenge, as Americans, to make sure there is room for both progress and preservation. ☒

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For more information on Civil War sites preservation, contact the following national organizations.

The Civil War Battlefield Foundation
1225 Eye St. N.W., Suite 401
Washington, D.C. 20005

The Conservation Fund
Civil War Battlefield Campaign
1800 North Kent St.
Arlington, Va. 22209

Association for the Preservation of Civil War Sites
P.O. Box 1862
613 Caroline St., Suite B
Fredericksburg, Va. 22401

North Carolina has numerous groups dedicated to preserving important Civil War sites. These local groups will play an important role in public/private partnership strategies for preserving our Civil War heritage.

For Fort Fisher, contact:
The N.C. Committee to Save Fort Fisher
P.O. Box 330
Wilmington, N.C. 28402

For the Battle of Bentonville, contact:
The Bentonville Brigade
c/o Bentonville State Historic Site
P.O. Box 27
Newton Grove, N.C. 28366

For Civil War sites around New Bern, contact:
Will Gorges
c/o New Bern Civil War Museum
301 Metcalf St.
New Bern, N.C. 28560

# Boola Boola, *Mola Mola*!

Give three cheers for the ocean sunfish, one of the earth's largest and strangest creatures, and surely the only fish that sunbathes.

by David Lee ©1992

The ocean sunfish looks like something created by a committee and tossed into the sea. Even this fish's simple scientific name, *Mola mola*, suggests a committee compromise, and is befitting a creature that borders on ugly. Almost anyone would be able to guess it is a fish, but only through a process of elimination. It couldn't be anything else. Sunfish have two eyes, fins, live in water and can, in a manner of speaking, swim.

For people unfamiliar with *Mola*, and this includes almost everybody, the name sunfish is most misleading. The bluegill, redbreast and other familiar sunfish are related to bass and other fresh-water Centrarchids. *Mola mola* is related to *Mola lanceolata* and *Ranzania laevis*. These three species comprise the only members of the distinct family Molidae, the ocean sunfish. Molids are pelagic ocean dwellers and as far as is known, live exclusively off a diet of jellyfish.

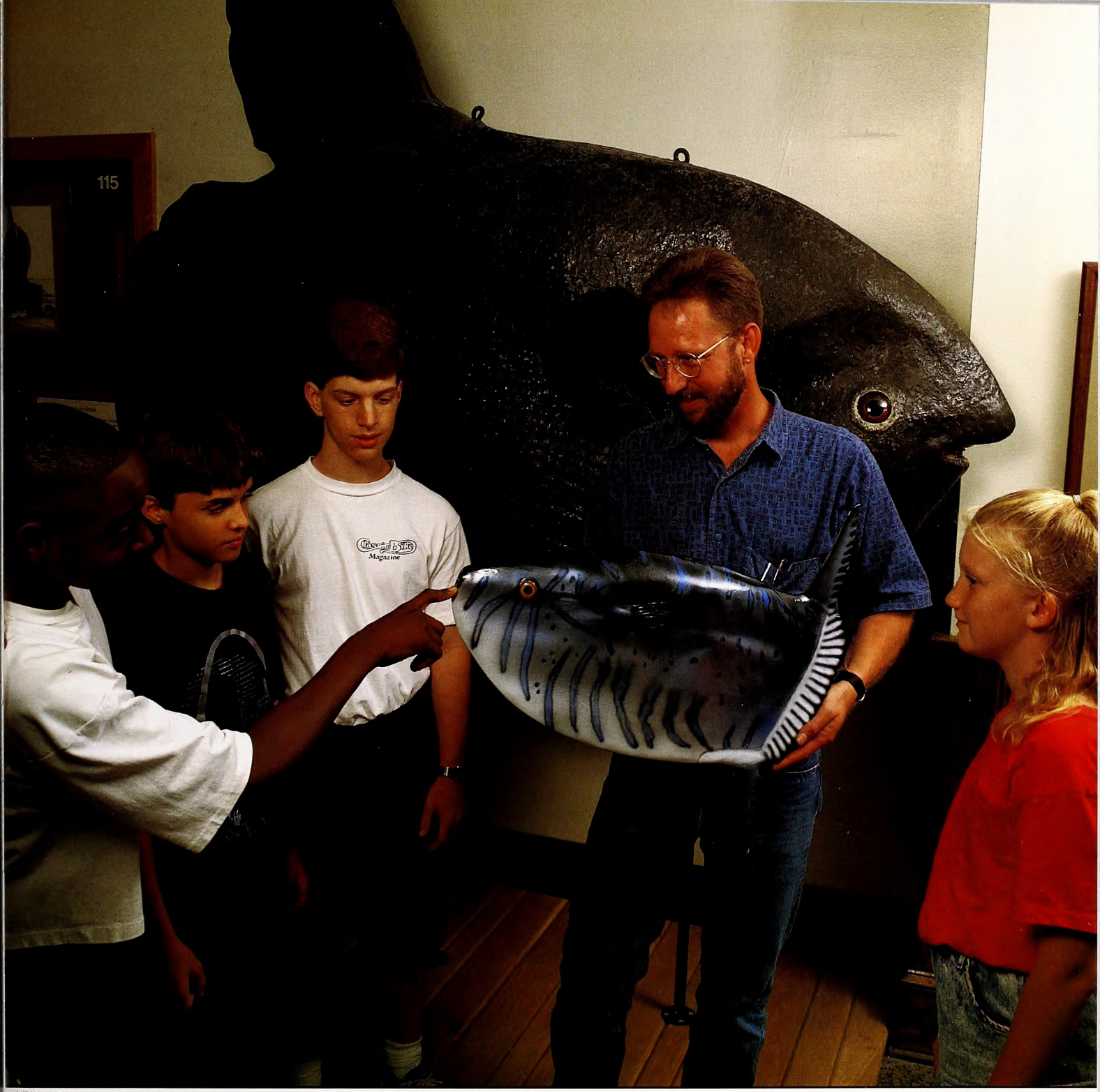
One never sees much written about ocean sunfish. They are common enough, but people seldom come in contact with them, and even marine biologists find little opportunity to study them. The fish are pelagic, have no commercial value and, because of dietary constraints, are not likely to be caught on a hook and line. Indeed the literature on ocean sunfish reads like a gazetteer: "The first record of an ocean sunfish from New Jersey;" "Sharp-tailed ocean sunfish from North Carolina;" and "*Mola mola* in Monterey Bay." The list goes on, each unexpected appearance from inaccessible ocean habitats making its way into scientific literature. When the records are pieced together they suggest that the round-tailed ocean sunfish, *Mola mola*, is a fish of temperate seas; *M. lanceolata*, the sharp-tailed ocean sunfish, is subtropical; and the slender mola, *Ranzania laevis*, is tropical. The currents of the North Atlantic redistribute live, sick and dead ones with enough impartiality and thoroughness to add a depth of confusion to simplistic interpretation of their distributions. All three can be found off the North Carolina coast, for example.

In North Carolina waters, *Mola mola* is certainly the most commonly encountered of the three species. I see them regularly on offshore sea bird surveys. They are not particularly hard to spot. Adults the size of dining room tables and larger ones up to 10 feet long and attaining weights of 4,400 pounds can be seen. Most other types of fish are not easily seen, much less properly identified far out at sea. Ocean sunfish, however, are one of the exceptions. They sun! They lie on their sides close to the surface, so close in fact that their dorsal fin often sticks upright, bent at an angle that exposes it to the air. The fin fans and waves in a motion that would appear to have something to do with forward swimming if only it were under water. The protuding fins are easily seen on relatively calm days, as is the massive body of the sunfish idling just under the surface. While the sunfish appears dim-witted because it does not seem to realize its fin is out of the water, it seems equally dim-witted to me that biologists have not bothered to explain why ocean sunfish have adopted this trait. The logical assumption would be that sunning helps to elevate internal body temperatures and speed up bodily processes, such as digesting jellyfish, but who knows?

Hunting down information on ocean sunfish reveals how little is known about this odd family of fish. Nothing is known, for example, about the location or season of spawning, egg development, age, growth or even the size at which they reach maturity. Because of their large size and cumbersome weight, few specimens have been preserved. Most studies of these fish are conducted entirely by analyzing literature descriptions rather than fish specimens. Their unique anatomy makes them challenging to describe even with ichthyological terms. Their fin arrangement is so different from most species that biologists cannot even agree on how to measure them. Minor discrepancies of fish measurement may seem trivial to the public, but such measurements are important to biologists. Written descriptions are perplexing, and while the North Atlantic species are fairly well known, it is not clear if only three species exist world-wide. Some described species are simply the opposite sex of fish previously classified. Others are the same species renamed several times. Sorting all this out is an ichthyologist's nightmare, and with the lack of preserved specimens for comparison, it's probably also an impossible task. It seems most unlikely that fishermen on the island of Yap, where stones are still used for currency, will be persuaded to maintain 1,000-gallon vats of formaldehyde on the off chance that one of the poorly described South Pacific species of sunfish might wash ashore.

Somewhat annoyed at the lack of available information on ocean sunfish, I began keeping records of their activities as an early aside to my sea bird studies. There was not much to record. I have noted the date sighted, what they were doing, the direction they were going, where they were, and the surrounding water temperatures. Fifteen years of record-keeping, including pertinent information from boat captains, has added only a few minor insights into our knowledge of their behavior.

The only species I have encountered at sea is *Mola mola*, but the other two species are known to visit the area. The small *Ranzania* has been reported from the Gulf Stream where I spend most of my survey time. The sharp-tailed ocean sunfish has a distinctive silvery appearance, so I am sure I have not mistaken one for the round-tailed type. In most cases, I have been able to see the tail shape clearly. In fact, it is not clear why the sharp-tailed sunfish is found in local waters. Records are of beached individuals, most found in winter. This seems contradictory to the expected habits of a subtropical pelagic fish. I suspect these isolated individuals might have been numbed by the cool sea and transported northward in Gulf Stream eddies from as yet undetermined wintering areas. It is also possible that the two unobserved species do not "sun" as frequently and are




MELISSA McGAW

***Dusty Wescott, an exhibit designer** at the N.C. Museum of Natural Sciences, shows off a fiberglass replica of a small tropical sunfish to a school group. On the wall behind them hangs the museum's famous ocean sunfish (Mola mola), a larger cousin. With a tiny mouth compared to its body size, sunfish are believed to feed entirely on jellyfish.*

therefore not as likely to be encountered as round-tails.

My sightings indicate *Mola mola* is basically solitary and largely found in waters less than 100 fathoms in depth. They do not live in the open sea, but in waters associated with the inner continental shelf. Most I've seen have been in water between 10 and 40 fathoms deep—a fathom is 6 feet—but in over 150 sightings only one was in sight of land. Nearly all were seen in areas where the surface water temperatures were between 50 and 65 degrees Fahrenheit, and sunning behavior was noted as early as 7:30 in the morning and continued throughout the day.

Most unexpected was our documentation that this sunfish is migratory. The species was absent during the winter, and rare during the summer. In the spring, however, large numbers were seen moving northward in the shallow waters over the continental shelf. The bulk of the spring movement occurred between mid-April and mid-May. The passing fall migration occurred primarily in October and November, with scattered individuals seen moving south as early as late

N.C. MUSEUM OF NATURAL SCIENCES

***This sunfish, now hanging*** *in the N.C. Museum of Natural Sciences, weighed an estimated 1,200 pounds and was recovered in Currituck Sound in 1926. It was prepared and mounted by H.H. Brimley, the first curator of the Museum, but not before it smashed through the dock when it was accidentally dropped from the hoist.*

August or as late as December. Earlier records of beached sunfish are so few and so scattered up and down the Atlantic coast that no hint of a migratory pattern has emerged. Furthermore, many dead specimens were probably transported by currents long distances from areas of normal occurrence.

There is no way to know what percentage of the total migration can be seen from the deck of a boat. Ocean sunfish are not obligated to live at the surface and ones even a few yards below the surface are difficult to spot. There are reliable records from other parts of the world of sunfish having been recorded at depths of over two miles.

Biologists separate the molids from other fishes because they are the only ones lacking a caudal peduncle. In the time it takes to look up what a caudal peduncle is, you can learn to simply recognize an adult Molid because they are the only fish shaped like a foot-thick, 100-pound pancake. They are also lacking in other parts that make fish look like fish. Indeed, you might think you're looking at the severed head of a large fish with a long healed-over scar along the trailing end. (Early authors referred to them as head fish.) Here and there are a few fins, mostly in the wrong places. The fin rays, which ichthylogists use to compare families of fish and justify evolutionary lines, do not correspond to the fin rays of other bony fishes. For one thing, they lack scales. Also, the pelvic fins simply don't exist, and the fin on the tail end of the fish is a fused conglomerate of several fins. *Mola* seem to use the tail as a rudder, but it is flexible.

The swim bladder, the device most fishes use to adjust buoyancy, has also been omitted, and the skeleton is made of cartilaginous fibers. Ocean sunfish have small round mouths with the upper and lower teeth fused into a beak. People who have been around captive sunfish report an audible grinding of the jaws, making the fish sound like "a hog eating corn." The hide is thick and very tough, but elastic. The males possess bright spots and a pointed nose that protrudes out over the mouth. Presumably the female is impressed.

What kind of fish has our committee created? I'm not sure personally, but some people who classify such things have placed Molids between porcupinefish and toad fishes. Others have them at the end of the fish classification system, and regard them as the most advanced of all fishes.

How creatures as large as this can support themselves on a diet of jellyfish defies logic. Actually it is hard to get a good fix on how it was determined that sunfish eat jellyfish. Nevertheless, this fact is widely reported in every account I have ever read. Ocean sunfish are frequently seen among large assemblages of jellyfish, both coelenterates and ctenophores. Charles Manooch, a biologist at the National Marine Fisheries Laboratory in

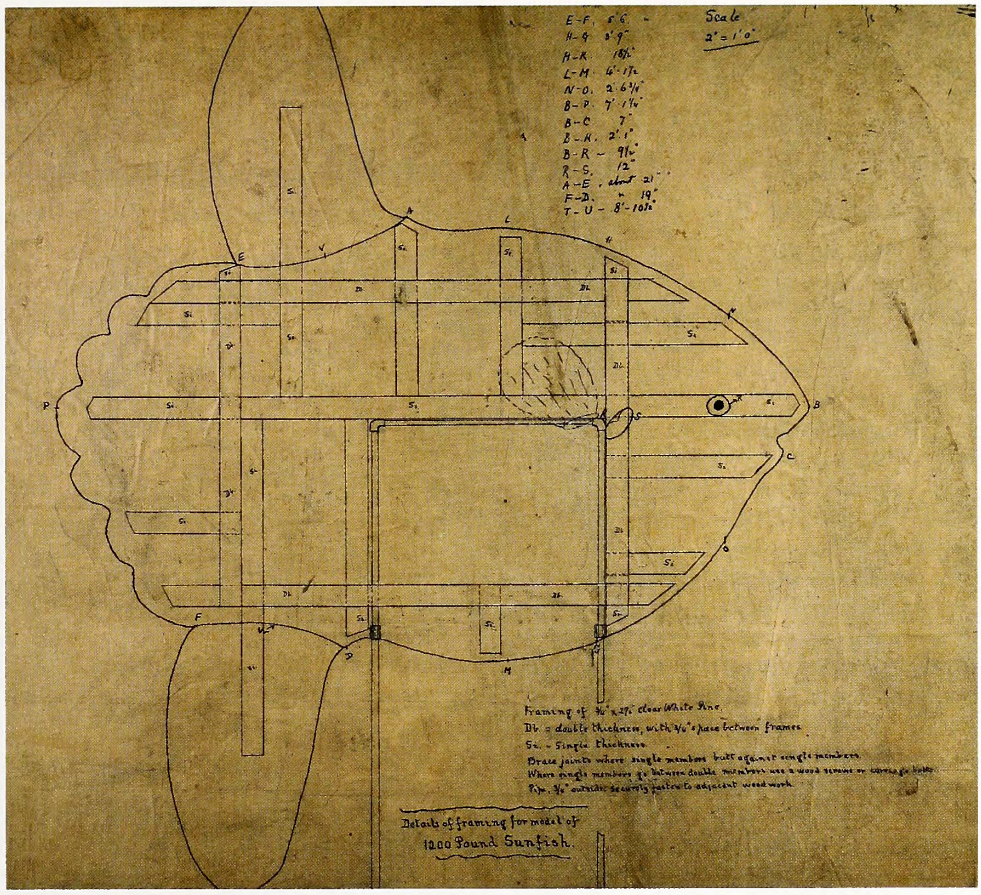
Beaufort, N.C., told me that once when he was scuba diving 20 to 30 miles out to sea, he saw one *Mola* associated with a large number of sea nettles. Only one of the ocean sunfish I have seen was clearly among jellyfish, but probably these prey items would not be easily seen from above the surface.

Because of their open ocean habits, I suspect the fishes' major food source may be salpas—usually called salps. Arranged like small rolls of Lifesavers, salps are chain-link colonies of transparent creatures. Their bodies are 95 percent sea water and another 3 percent consists of the salt needed to retain osmotic balance. This leaves the animal colony with less than 2 percent organic matter. This suggests that sunfish must consume at least 20 times more food for daily protein requirements than they would need if they ate more conventional food.

Most of the literature concerning *Mola*—except that which lists places where dead ones have washed ashore—relates to their larval development. It seems that people have been fascinated, not just by the strange looking adult, but also by their strange-looking spiny-plated, globular larvae. Biologists have been describing young sunfish since at least 1880. The life history is complex with more than one complete metamorphosis in the larvae. Yet even though this interest spans more than 100 years, knowledge of the early development cycle remains incomplete. Most of the larval fish are difficult to study and harder to describe and illustrate because those that have been found usually come from the stomachs of predatory fishes. Larval fins, and the important fin rays that biologists use to track development, are usually already digested. The number of larval and prejuvenile sunfish in the North Atlantic at times must be astronomical. A small female *Mola* examined in 1921 was estimated to contain no fewer than 300 million eggs. Ocean sunfish thus potentially have the highest reproductive output of any vertebrate.

Other than seeing shark-like protuding dorsal fins, most charter boat captains have little first-hand experience with ocean sunfish. "They may seem slow, but we never hit them with the props," Captain Allen Foreman stated last summer. To prove his point, he deliberately ran toward a large one sunning off our starboard. The fish, without ceremony, simply sounded. They maneuver effortlessly.

The sunning fish all look like they are swimming in slow motion. One day when our charter boat was broken down I watched several sunfish swim past our boat, and they were out of sight in several minutes. Time, distance and speed are so relative that the *Mola* may be a stronger swimmer than it appears. Captain Harry Baum, another Outer Banks fisherman, once told me of gaffing a small sunfish. He was impressed with the strength of the fish, and only after considerable effort was he able to get it into the boat. He said the fish produced such a stench that everyone on board was in favor of throwing it back. The fish quickly swam off.




N.C. MUSEUM OF NATURAL SCIENCES

***Brimley's mount*** *of the giant sunfish was a complex undertaking. The specimen is constructed of an interior frame (above), and a plaster cast of the body; however, the fins are from the actual fish. Even by today's standards, Brimley's sunfish is magnificent.*

One of the more remarkable feats involving man and ocean sunfish hangs in the N.C. Museum of Natural Sciences. I pass it several times each day going to and from my office. It is a mounted *Mola mola* prepared in the late 1920s by the legendary H. H. Brimley, the first curator and director of the museum. The fish was discovered partly stranded in Currituck Sound on May 30, 1926; undoubtedly a lost migrant. To retrieve the fish, an anchor was hooked into one of its gill openings and the fish was towed to a dock. It was improperly released from its hoist and unexpectedly smashed through the planks of the dock. It's weight was estimated at 1,000 to 1,200 pounds. Brimley measured the specimen, and found it to be 85 inches long. The greatest thickness was 49 inches and from fin-tip to fin-tip, 99½ inches in height. The open mouth was only 3 inches by 5½ inches. The skin was slimy and it adhered very closely to the underlying muscular tissue. The actual skinning of such a specimen seemed to Brimley to be a rather hopeless undertaking. Instead, he made a plaster cast of both sides of the fish, saving the fins and a few other parts.

Back in Raleigh, Brimley reconstructed the fish from the mold. Ten years back I chanced upon Brimley's original sketch of how he proposed to support the hollow cast of the huge fish. There are many buildings that have less construction details than the inside of that fish model. The finished specimen is a masterpiece. Not only is it an excellent example of early-1900s create-as-you-go taxidermy, but it compares well to fish prepared with modern techniques and synthetic light-weight materials. It is a true museum piece in every sense of the word. To persuade our museum's exhibit committee to put the giant *Mola* back on display took some doing. The specimen was so large that it was too tall to fit in our exhibit area. Its dorsal fin extends through the ceiling.

Committe creature or not, the specimen is not only a tribute to the self-taught skills of Brimley, but is a life-like example of a very strange fish. ☒

*Population Over 30,000 and Still Growing*

# Wild Turkey Restoration Going Great in North Carolina

*Written and Edited by Vic Venters*

Despite less than favorable trapping conditions, good progress was made with the N.C. Wildlife Resources Commission's wild turkey restoration program this year. During the year, 313 wild turkeys were relocated to 30 different restoration sites across the state, and 185 birds were live-trapped in North Carolina and moved to other sites in the state. Relocation of in-state birds was supplemented by the acquisition of 128 wild turkeys from South Carolina.

All nine Wildlife Commission districts received birds this year. Under the Commission's restoration plan, wild turkeys have been live-trapped, then relocated to other suitable habitat where populations are low or have been eliminated in the past. Once relocated, the transplanted birds are protected until they reproduce to huntable numbers. North Carolina allows only a spring harvest of gobblers, or male turkeys, which does not harm healthy turkey populations.

The number of birds relocated this year is second only to last year's record number, when 508 birds were relocated. This year, however, trapping conditions were unfavorable. "We had a tremendous mast crop," explained Mike Seamster, the Wildlife Commission's wild turkey project leader. "With all this natural food available it was hard to get the birds to respond to bait in our traps. We also had a very mild winter and this also lowers the turkey's willingness to come to bait. As a result, we didn't trap as many birds as we did last year."

The same conditions affected trapping in other states. "South Carolina had committed 200 birds to us, but it was able to provide only 128," Seamster said. "However, trapping conditions were tough down there as well, and South Carolina personnel worked extremely hard to send any birds here. Wisconsin, which also supplies us with birds, was unable to send any because of difficult trapping conditions up there."

The birds from South Carolina were acquired through the National Wild Turkey Federation's Super Fund Program. The North Carolina chapter of the National Wild Turkey Federation also paid $3,200 to assist in the acquisition of birds from out of state.

"It was still a good year," Seamster said. "The number of birds we moved was second only to last year's record figures. The acquisition and relocation of these birds have enabled us to accelerate our restoration program and should pay big dividends to the sportsmen of this state in future years."

Seamster estimated that North Carolina's current wild turkey population is between 30,000 to 35,000 and growing fast. In 1990, the population was estimated at 28,000.

***Traveling Turkeys:*** *Wildlife Commission relocated 313 wild turkeys to 30 different sites this year. In-state, 185 birds were live-trapped and moved, while 128 were obtained from South Carolina and introduced to North Carolina.*

*Habitat Use to be Examined*

## Black Bear Study Under Way in Coastal Plain

JACK DERMID

***Bearly Known:*** *Biologists with the Wildlife Commission are launching a new research study to examine black bear biology in eastern North Carolina. The project will answer questions about how the bears are surviving in the intensively managed landscape.*

One of the big wildlife management surprises in the 1980s was the apparent increase in black bear populations on northeastern North Carolina's intensively managed private forests and farms.

To examine the reasons behind the population increase, the N.C. Wildlife Resources Commission and researchers from the University of Tennessee and Weyerhaeuser Company have initiated a major four-year bear study project.

"We'll be monitoring bears by radio-collars to find out how they relate to habitat in an intensively managed timber/agriculture setting," said Bobby Maddrey, the Wildlife Commission biologist who will be working on the cooperative project. "We want to determine exactly what type of habitat the bears are using and how they use it."

The study will be conducted on Weyerhaeuser lands in Craven, Pamlico and Beaufort Counties.

"Intensive farming and timbering practices, including land clearing and road building, have definitely impacted populations of black bears in eastern North Carolina," Maddrey said. "However, high population densities still exist in some areas and crop depredation problems and car collisions involving bears are commonplace."

Most of the previous bear studies in the Southeast have been conducted on federal wildlife refuges or in areas that are not intensively managed for timber and agricultural production. "This study is significant because it is one of the first to look at bears on private lands in the Southeast," said Dr. Michael Pelton, professor of wildlife science at the University of Tennessee and coordinator for the project. "It should give a clear picture of how black bears use the mosaic landscape of forested and agricultural areas in coastal North Carolina, and it should delineate those components of the habitat important to the survival of the species. We will also examine impacts of hunting mortality, depredation control, road kills and other human activities on populations."

In 1990, Weyerhaeuser and the Wildlife Commission entered into a memorandum of understanding to manage bear populations on company lands.

Although not directly related to this agreement, the data obtained by this new study should give Commission biologists a better idea of how to manage the black bear populations in eastern North Carolina.

## Mountain Land Protected

Another portion of the biologically important Grandfather Mountain area in western North Carolina has been protected by the North Carolina chapter of The Nature Conservancy. A conservation easement of 360 acres was donated to the Conservancy by the Wilmor Corporation.

In addition, the Wilmor Corporation will deed 74 acres (which will include the Profile Trail) to Grandfather Mountain Inc. In turn, Grandfather Mountain Inc. will donate a conservation easement over the same area to The Nature Conservancy. In addition to the 74 acres covered in this donation, Grandfather Mountain Inc. has been in the process of donating 1,766 acres of high rocky summits of Grandfather Mountain, known as the Grandfather Mountain back country, to the Conservancy.

Grandfather Mountain is considered one of the five most important natural areas in the Southern Appalachians. From the standpoint of rare plant species alone, Grandfather Mountain is the single most important mountain in eastern North America.

A conservation easement is a legally binding agreement that allows the landowner to retain title to the property but prohibits development and other potentially destructive uses. The natural area covered in the easement is located near Highway 105 between Linville and Boone and comprises mature forests that are home to many populations of rare and endangered plants and animals, including the Northern flying squirrel. The area's cove forests and northern hardwood forests also harbor one of the largest-known populations of bent avens, a federally listed endangered plant.

*—The Nature Conservancy N.C. Chapter*

*Send for Free Seeds*

## Wild Blue Indigo Is Wildflower of Year

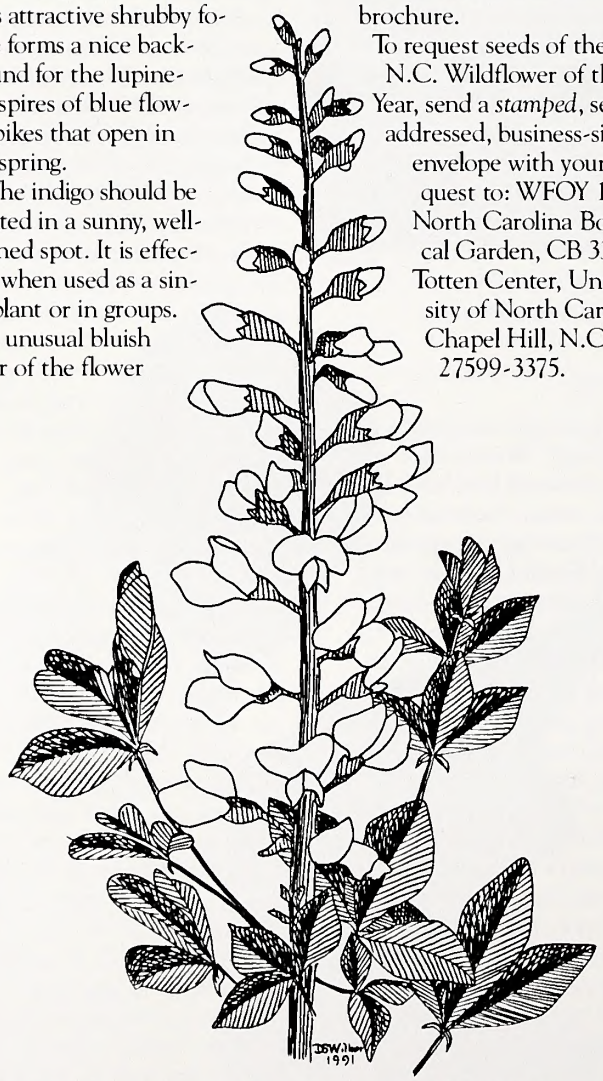
The wild blue indigo *Baptisia australis* has been selected as the 1992 Wildflower of the Year by the North Carolina Botanical Garden and The Garden Club of North Carolina Inc. Free packets of seeds are available to those interested in adding this wildflower to their garden.

This long-lived, sun-loving perennial is a member of the pea family. Wild blue indigo forms a compact mass of dense blue-green foliage each season. This attractive shrubby foliage forms a nice background for the lupine-like spires of blue flower spikes that open in late spring.

The indigo should be planted in a sunny, well-drained spot. It is effective when used as a single plant or in groups. The unusual bluish color of the flower spikes is enhanced by many other colors in the spring garden. Pink, yellow, purple and white flowers are all complemented by the combinations they make with blue wild indigo.

The Wildflower of the Year project is now in its eleventh year. Thousands of gardeners in the state have received seed packets and the native plant conservation message contained in the accompanying Wildflower of the Year brochure.

To request seeds of the 1992 N.C. Wildflower of the Year, send a *stamped*, self-addressed, business-sized envelope with your request to: WFOY 1992, North Carolina Botanical Garden, CB 3375, Totten Center, University of North Carolina, Chapel Hill, N.C. 27599-3375.



***Seedy:*** *Wild Blue Indigo has been chosen as the 1992 Wildflower of the Year by the N.C. Botanical Garden and by the Garden Club of North Carolina. Free seeds and gardening tips are available.*

*Features 90 Sites*

## Watchable Wildlife Guide Available

North Carolina is blessed with one of the richest diversities of animal and plant species of any state in the nation. Yet surprisingly few people are aware of the many places some of these wildlife species can be observed and enjoyed.

A new book, *The North Carolina Wildlife Viewing Guide*, should change all that. This guide covers 90 prime viewing sites in the state, each selected by a panel of North Carolina wildlife experts for its unusual, abundant or diverse wildlife viewing opportunities. Featured in the guide are regional maps, color photos, descriptions of sites and attendant species, directions to sites and easy-to-recognize markers identifying available wildlife and available on-site facilities.

The 96-page book was written by Charles Roe, now the executive director of the North Carolina Heritage Foundation and a coordinator for the North Carolina Audubon Council. Roe's previous publications include the *Directory to North Carolina Natural Areas*, as well as handbooks and guides related to natural land protection. Additionally, over half of the photos in the book were provided by Ken Taylor, chief photographer for the N.C. Wildlife Resources Commission.

The *North Carolina Wildlife Viewing Guide* is one of 12 other wildlife viewing guides produced in the nation in 1992 that used a similar format. Eventually, Falcon Press, which published the new guide, hopes to print guides for almost all 50 states.

Along with the conservation group Defenders of Wildlife, cooperators in North Carolina included the Wildlife Commission, other state agencies and a variety of conservation groups. The project began with Defenders of Wildlife's *Oregon Wildlife Viewing Guide*. Other state, federal and private conservation groups became involved, and the project spread to other states and to Canada.

The Watchable Wildlife Program is a national effort to stir public interest and garner needed support for habitat enhancement and preservation programs, wildlife areas, parks, refuges and preserves.

Copies of the book cost $5.95 apiece and are available from Falcon Press, P.O. Box 1718, Helena, MT 59624, from local bookstores and from conservation groups.

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before traveling to an event. Listings for this calendar should be conservation oriented and should be submitted four months in advance.

**July 17-18**

Day of the Dolphin, a coastal dolphin monitoring program, needs volunteers to participate in this research/observation project. To be held at various sites along North Carolina coast. For more information, contact the Cetacean Awareness Programs, 221 Clancy Circle, Cary, N.C. 27511, or call (919) 469-8780.

## It's Bob, Not Bill

In the May 1992 issue of *Wildlife in North Carolina*, we incorrectly identified the author of the article "River Bass." The author's correct name is Bob Lamb. We apologize for the error.

## Wildlife Endowment Fund Report

**April 1992**

Principal Balance
$16,772,569.29

Interest Earned
$9,365,726.30

Total Receipts
$26,138,295.59

Interest Used
$3,282,016.48

Fund Balance
$22,856,279.11

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

*Over 2,000 Acres Added*

## Refuge Expanded with Duck Stamp Money

Ducks, geese and other wetlands-dependent wildlife will benefit this year in North Carolina and across the nation, thanks to funds provided by waterfowl hunters and other purchasers of the Federal Migratory Bird Hunting and Conservation Stamp, more commonly called the Duck Stamp.

Monies derived from the sale of Duck Stamps go to the Migratory Bird Conservation Fund. This year, $4.8 million from this fund will go to purchase 7,700 acres of critical wetlands habitat across the nation for eight projects, including one in North Carolina. In each of the cases, new land will be added to existing national wildlife refuges.

In North Carolina, $985,000 from the fund will be used to acquire 2,000 acres in the Roanoke River National Wildlife Refuge. The acquisition will bring total acreage managed by the U.S. Fish and Wildlife Service at the Roanoke River refuge up to 6,200 acres. Eventually, the U.S. Fish and Wildlife Service hopes to expand the Roanoke refuge to about 33,000 acres. This refuge is the largest intact and undisturbed bottomlands wetlands complex in the Southeast, providing critical habitat not only for wintering waterfowl but for many rare and endangered plant and wildlife species.

Funds derived from the sale of Duck Stamps, mostly purchased by waterfowl hunters, have been used to purchase 33 percent of all federal wildlife refuges in the lower 48 states.

All waterfowl hunters 16 years or older must purchase a Federal Duck Stamp, in addition to state waterfowl stamps.

*Take Pride In America*

## Education Publication Wins Award

This spring, the N.C. Wildlife Resources Commission's Division of Conservation Education won a state Take Pride in America award for producing *North Carolina WILD Notebook*.

Take Pride in America (TPIA) is a national and statewide campaign designed to increase awareness of the need for wise use of natural and cultural resources, and to encourage a sense of public lands stewardship.

*North Carolina WILD Notebook* is an educational publication designed to teach teachers and students about conservation of North Carolina's natural resources and environment. It reaches an estimated 310,000 students and teachers in the state each year. It is published eight times per year in the school calendar year.

Actress Linda Evans, a national spokesperson for TPIA, and William Cobey, Secretary of the N.C. Department of Environment, Health and Natural Resources, presented the awards in a ceremony in Raleigh in April.

N.C. DIVISION OF PARKS AND RECREATION

***We Take Pride:*** The Division of Conservation Education won a Take Pride In America award this spring for its educational publication, *North Carolina WILD Notebook*. Presenting awards were actress Linda Evans, national TPIA spokesperson; William Cobey (center), Secretary of the Department of Environment, Health and Natural Resources; and John Poole, coordinator for the TPIA program in North Carolina.

# Informed Decisions

*by Vic Venters*

Responsible wildlife management is rarely easy, and solutions aren't always simple. Take the case of resurgent beaver populations. Although a headache for many landowners, beavers have also led to an increase in wood ducks in the state. How can you keep the benefits and solve the problem? The same applies with declining small-game habitat. How do you create or protect good wildlife habitat and make it economically attractive to landowners? A new video and newsletter may help.

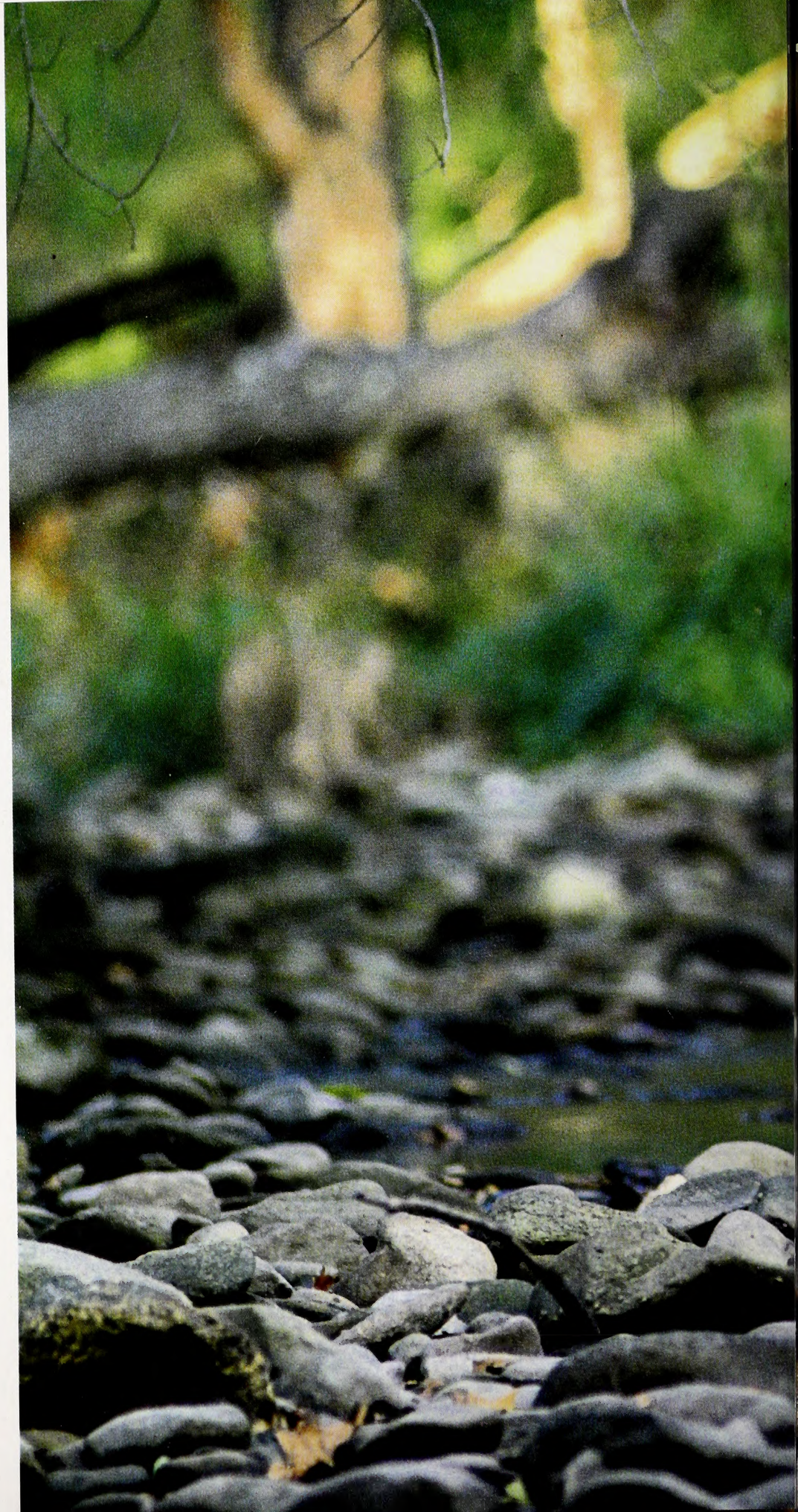
*Beaver Bogs:* With beaver populations expanding in North Carolina, the toothy rodent is coming into conflict with more and more landowners as timber is flooded or destroyed. Yet, beavers also create valuable pond and wetlands habitat for waterfowl and other wetlands-dependent species, and their ponds improve water quality by helping filter silt and other pollutants from streams and creeks. A new video, *The Beaver Pond Leveler—One Solution*, is now available for those who may be experiencing beaver problems. The video details a new water-drainage device that was developed at Clemson University. The device has proven highly effective in three years of testing. It has enormous implications for relieving flooding on agricultural and timber lands and should be of interest to those who manage beaver ponds as waterfowl impoundments. To borrow a copy of the tape (VHS format), contact Ed Jones at the Cooperative Extension Service, Department of Forestry, Box 8003, Raleigh, NC 27695-8003.

*Warm Season Wag:* A quarterly newsletter, *The Native Grass Manager*, is now available for those interested in planting and managing warm-season grasses on their property. Warm-season grasses are native, bunch-forming grasses that provide excellent small-game and wildlife habitat. They are also economically attractive to landowners because they provide excellent erosion control and nutritious forage for cattle, especially in the summer months when cool-season grasses like fescue are dormant. Because interest in warm-season grasses is fairly recent in the Southeast, specific planting and management data can be hard to come by. This four-page newsletter should fill that gap. Subscriptions are $5 per year. For more information, contact The Native Grass Manager, P.O. Box 152, Clinton, Mo. 64735.

# The 10th Anniversary Edition N.C. Duck Stamp Print Is Here!

"Widgeon at Bodie Island Lighthouse"
painting by Richard Plasschaert

Richard Plasschaert, North Carolina's 1983 first of state duck stamp artist, returns with this special anniversary edition painting, "Widgeon at Bodie Island Lighthouse." To order your 1992 North Carolina duck stamp print, contact your art dealer. Stamps can be purchased from any wildlife license agent. Money from the sale of these prints will help waterfowl through land acquisition, conservation of wetland habitat and research.



**Summer Interludes**

Though they keep a watch for predators, this wary white-tailed doe and her fawn take time to cool their heels in this mountain stream.

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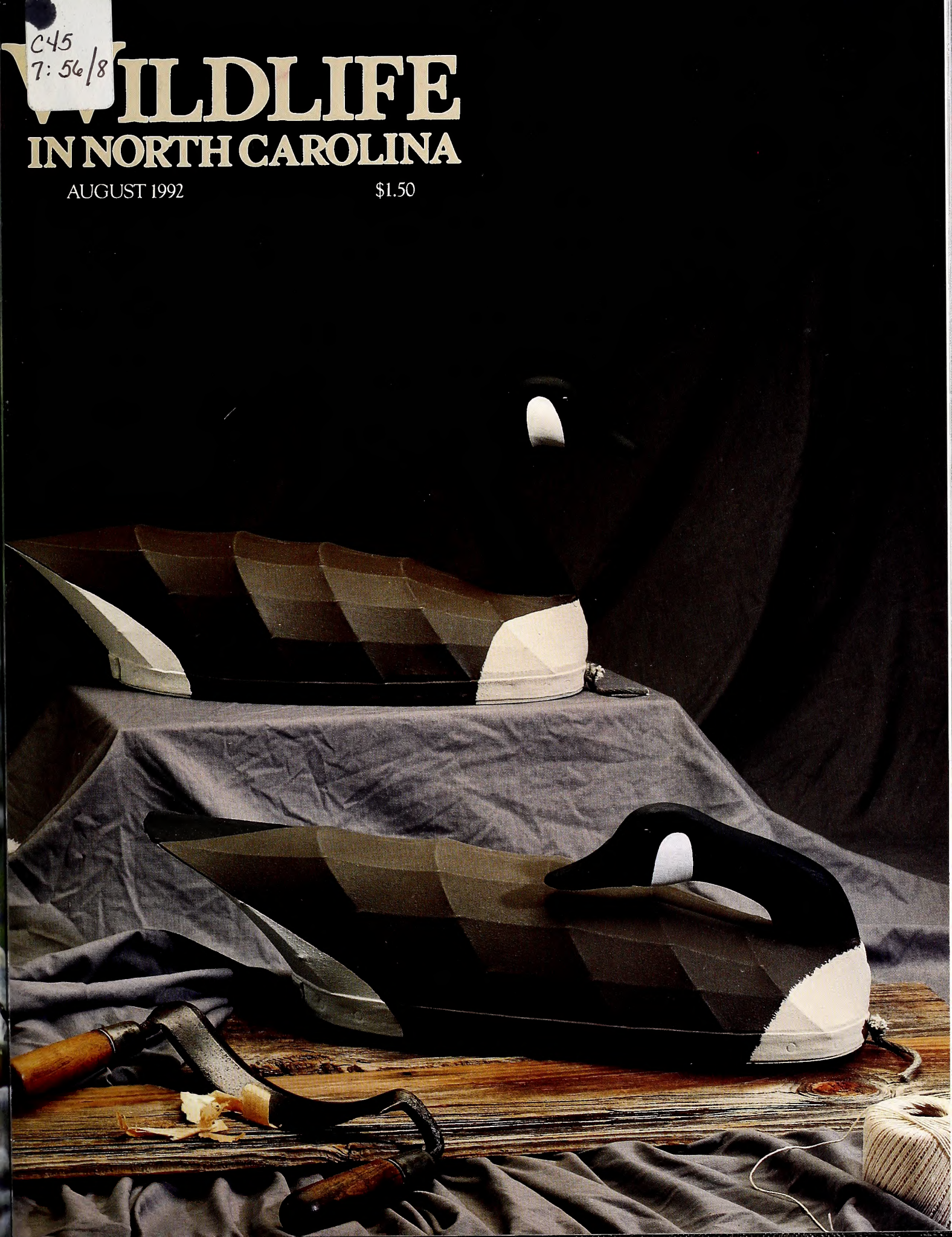
# WILDLIFE IN NORTH CAROLINA

AUGUST 1992 $1.50

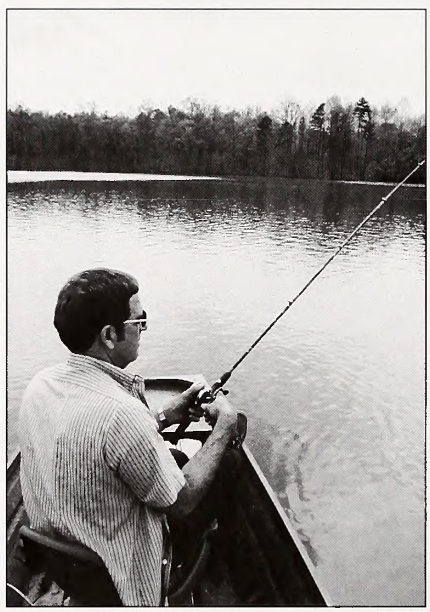


# If You Had Only One Bass Lure

*by Jim Dean*

When I was about 10 years old, I had one rod and reel and one bass lure. Life was simple. I had no really important choices to make. Then, one day a bass broke my line and ran off with my lure. My grandfather felt so sorry for me that he bought me two lures. Alas, that act of generosity put an end to my early innocence, and I have wrestled with the burdens of indecision ever since.

Choosing which lure to use is no small matter, of course, and maybe that's why bass fishermen love to debate the "big" question. If you could have but one lure to fish with the rest of your life, which would you choose?



JIM DEAN

It's a hypothetical question, of course, because water, weather, time of year, time of day and other factors all influence the many types of lures we use. Successful bass fishermen need lots of different lures, but what if we really had to select just one to use throughout the year?

Just for the fun of it, let's see how your choices compare with mine. Of course, any single lure we pick is going to be a compromise, so before I narrow it down to one, let's discuss several that deserve consideration.

When I first began fishing for bass 40 some years ago, I always used topwater lures, and my favorite was an old wooden Nip-I-Diddee with twin props. Later, I added the Jitterbug, Hula Popper and Devil's Horse. All are still great surface attractors, but the Heddon Baby Torpedo sometimes catches fish when these old favorites don't. Oddly, it often works best when it's worked rather quickly with a series of rapid jerks and occasional pauses so that it bobs and darts while the little tail prop spins. It would get my vote except that—like all topwater lures—it's pretty much a warm-weather, shallow-water lure.

In recent years, I've discovered another topwater lure that might be even more versatile. Modern buzzbaits are more nearly weedless than most surface lures, and they sometimes wake up bass when nothing else works. They're even effective in very early spring and fall when other topwater lures fail, and they cover a lot of water quickly. A buzzbait is a tough choice to ignore, but I couldn't pick it as my only lure.

If I'm restricted to a single choice year-round, that means I probably should consider an underwater lure. What about the Rat-L-Trap and its many imitators? Of all the underwater plugs I've ever used, it's clearly one of the best. I can very nearly catch fish on it year-round in both shallow and deeper water, and there are lots of days throughout the year when it's the most productive plug in my box. Still, I don't think I'd choose it as my only lure. The same goes for spinnerbaits. They're versatile, nearly weedless, and can be fished deep or shallow, but I don't find them quite as effective during the warmer months, and that's when I fish most often.

What about plastic worms or lizards? Most bass fishermen would stop right here because these soft-plastic lures probably catch more bass than any other type. They're almost totally weedless, and rigged with or without a weight, they can be fished from top to bottom in all types of cover. Bass love 'em, and if my interest in fishing were purely a matter of catching bass, I wouldn't hesitate to choose a plastic worm.

If I'm going to pass up all those great choices, what am I left with? Back in the 1950s, a lure designer from Finland came up with a diving balsa minnow. Laurie Rapala's lure was such an immediate sensation that it spawned many imitators—the plastic Rebel and balsa Bagley Bang-O-Lure to name just two. These lures have some disadvantages in that the popular floating-diving models can't fish deeper water, nor are they weedless. Even so, if I had to choose a single lure to fish with year-round the rest of my life, I'd strongly consider one of these floating-diving minnows about 5 or 6 inches long in a silver or pearlescent color.

Fished slowly on the surface with occasional darting twitches, few topwater lures can beat them. You can also retrieve them steadily or erratically down to depths of about 3 feet, and they seem to work well not only during the warm months, but also in very early spring and fall. Most important, they're fun to use. Admittedly, if I fished big lakes with lots of deep water all the time, I'd have to reconsider the plastic worm as my one-lure choice, or possibly a Rat-L-Trap or deep-diving crankbait.

Alas, the truth is that I don't always make very practical choices, and have been known to fish a Jitterbug just for the fun of it even when I know other lures would work better.

In fact, I'd go crazy if I had only one lure. Shucks, I can't get along with a mere 300. Like most fishermen, I'd probably have to admit that my favorite lure is invariably the one I used to catch my last bass.

August, 1992
Volume 56, Number 8

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Cover** *Canvas decoys much like these made by Nick Sapone were first developed for use in southeastern Virginia and northeastern North Carolina, and were particularly popular in Dare, Carteret and Hyde counties. Photographed by Melissa McGaw.*

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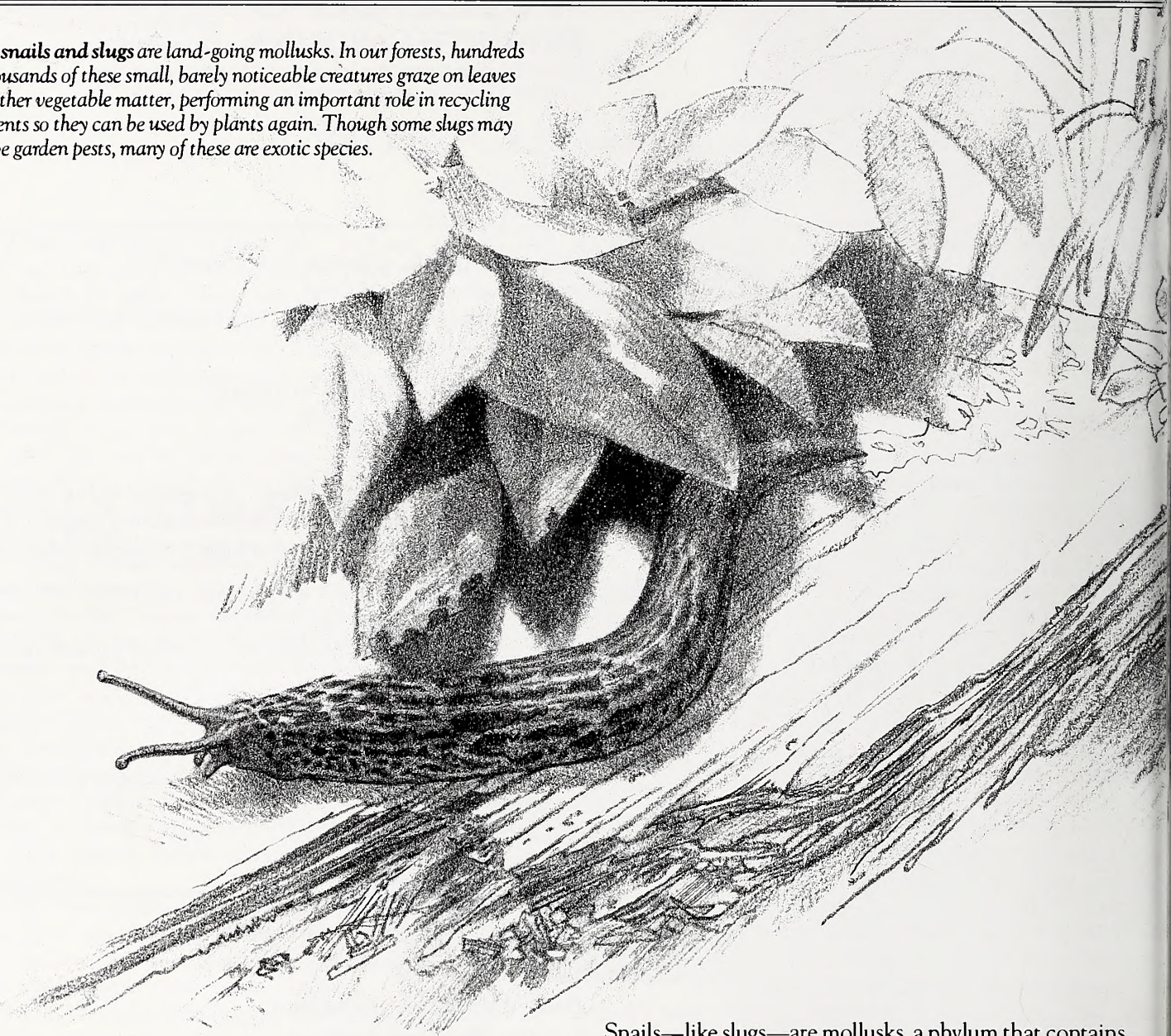
***Both snails and slugs** are land-going mollusks. In our forests, hundreds of thousands of these small, barely noticeable creatures graze on leaves and other vegetable matter, performing an important role in recycling nutrients so they can be used by plants again. Though some slugs may also be garden pests, many of these are exotic species.*



# Naked Goes the Slug

*written by Lawrence S. Earley*
*illustrated by David Williams*

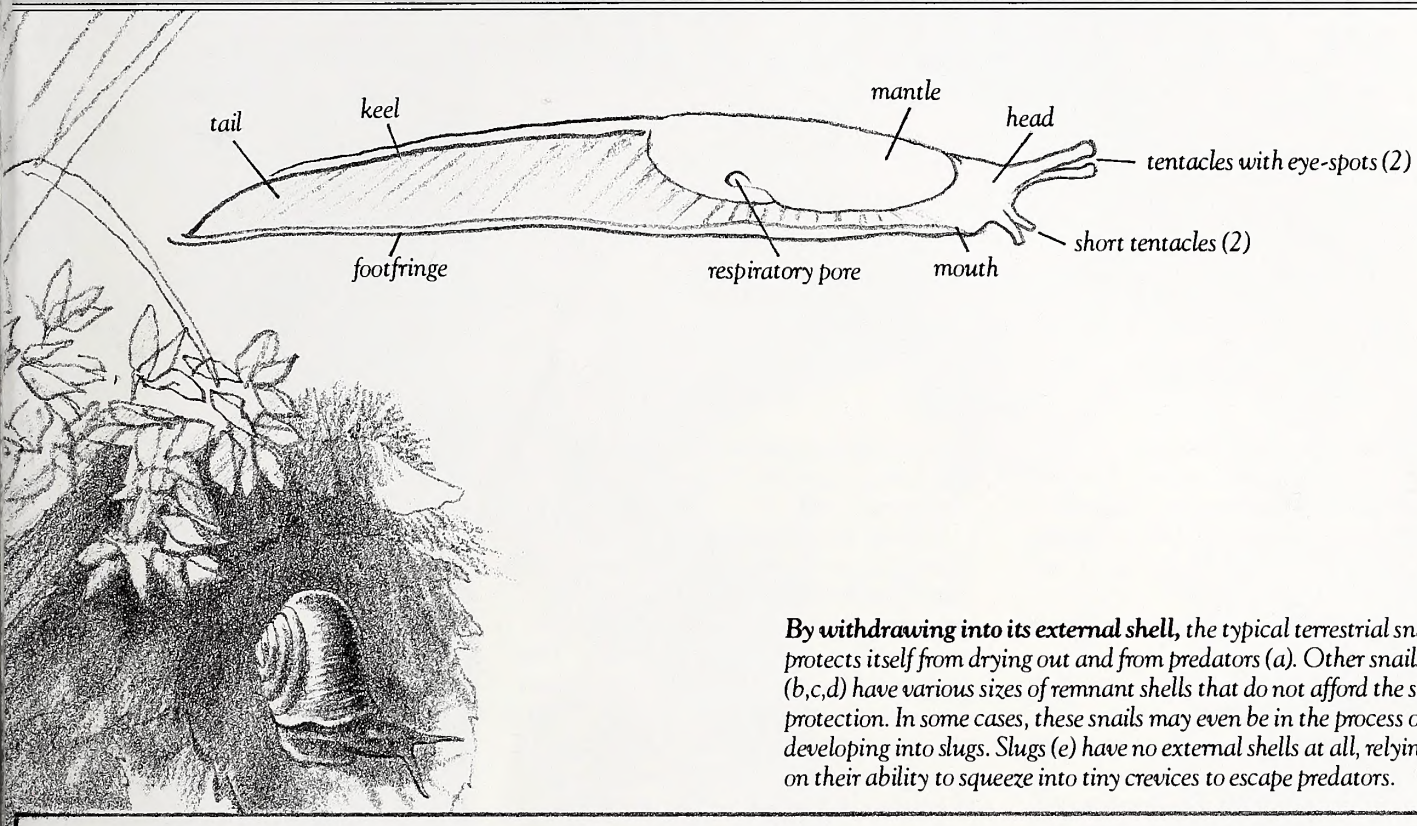
Slugs get no respect. People don't like them, and some are so disgusted by slugs you'd think they'd seen . . . *The Alien*. "Whoa! You almost stepped on that thing!" Slugs are only snails without their hard hats, and though both will bring their mostly vegetarian appetites to your garden, in the minds of many slugs are the thugs.

Yet, there's much to admire about slugs. They've taken an extraordinarily risky step in their long evolutionary march by making their way naked in the world. To understand what's in it for them—the rewards as well as the hazards—you have to know something about snails.

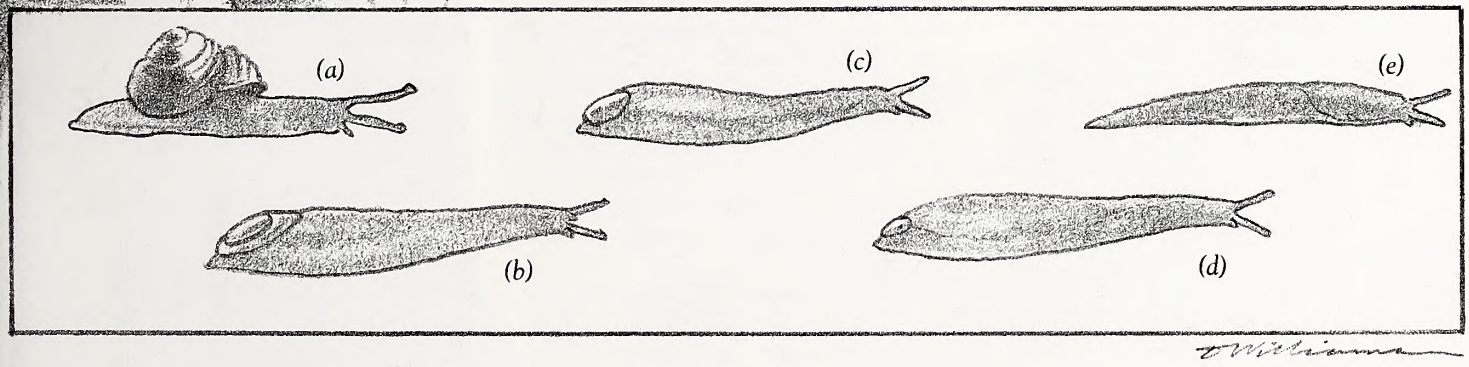
Snails—like slugs—are mollusks, a phylum that contains terrestrial, freshwater and marine species (see "The Hungry Whelk," July 1992). Most mollusks are shelled creatures, and hard shells have a lot of advantages. They protect you from predators, but perhaps more important to snails, they preserve you from drying out. An extended drought threatens snails because they need damp and moist conditions to survive. Within their shell, a snail can hold out for months, and perhaps even years, in times of drought.

If shells are so handy, then, how do you explain slugs? Not only have slugs arisen independently from several snail families, but it seems that some 1,000 species of snails are in the process of becoming slugs. At least, that's what Alan Solem maintains in *The Shellmakers*. Carrying shells that are so small they no longer serve as shelters, these semi-slugs may eventually become full-fledged slugs. Going naked seems to be a trend among snails.

Why have snails been so eager to get rid of their shells? The




***By withdrawing into its external shell,*** *the typical terrestrial snail protects itself from drying out and from predators (a). Other snails (b,c,d) have various sizes of remnant shells that do not afford the same protection. In some cases, these snails may even be in the process of developing into slugs. Slugs (e) have no external shells at all, relying on their ability to squeeze into tiny crevices to escape predators.*




answer has a lot to do with environment. A snail needs calcium in the soil or in the plants it eats to make its shell. Normally, a lack of calcium in the soil would limit snail populations. But a lack of calcium may be offset if the area is humid and gets a lot of rain. Under these conditions, a snail might not need a shell since drying out isn't as much of a threat. These conditions are found especially in extremely wet areas like the Pacific Northwest and our own Southern Appalachians where slugs exist in great numbers.

Though nakedness can increase the threat of being eaten by a predator, this danger may be compensated for by the variety of tiny refuges—crevices, cracks and burrows—that are available to a creature unencumbered by a shell. Besides, many slugs seem to taste so bad that only a few predators—mostly beetles, moles, garter snakes, shrews and ducks—will have anything to do with them.

Their need for wet conditions is one reason why slugs are normally nocturnal. Sunlight can crisp a slug in no time, but our damp and humid nights are perfect for the slugs to make their appointed rounds. You'll know that they have been abroad by the tell-tale holes in your marigold leaves and also by the silvery slime tracks they leave. This slime is mostly water. Indeed, the slug is mostly water—up to nearly 90 percent in some species—which is why salt poured on them will kill them. As the slug moves, several glands below the head release copious amounts of mucus that enables it to ooze along at a speed of about .0056 mph.

Some slugs are garden pests, but many of the most virulent of these pests are exotics: of the 21 slug species found in North Carolina, only 10 of them are North American natives. The large spotted slug often seen in summer is the *Limax maximus*, an introduced European species. Most of our native slugs are esteemed members of the detrivore community, annually reducing tons of fallen leaves and rotting wood to their nutrient parts so plants can use them.

Which only shows that some slugs are worth going to bat for.

# Decoys of Cloth

## Canvas-covered decoys define North Carolina's early goose- hunting heritage.

written by Eddie Nickens © 1992
photographed by Melissa McGaw

Consider, as many have not, the canvas decoy. Its size—that of a mature Canada goose or swan—belies its weight. There is just enough heft in just the right places, down low and below decks, but still the goose is light enough to transport with ease and to bob and dip with the lightest breeze. Its construction—of wire, string, cloth and a carved head—belies its hardiness. And its appearance—in decoy spreads that numbered in the hundreds—beguiled countless Canada geese, swans and ducks that poured down the Atlantic Coast in the decades that framed the turn of the 20th century. Tough enough for stormy weather, light on its feet, able to pass muster under close scrutiny, the canvas decoy was the perfect lie.

For waterfowlers, such decoys are a microcosm of North Carolina's coastal heritage. Canvas decoys were a natural extension of the watermen's lives: the birds were formed with canvas from an old sail, wire-shaped like battens in a jib, a hull made watertight with paint, an anchor line attached to the bow. Large timbers required for large decoys were rare on the Outer Banks, but canvas and sailcloth were daily staples for the watermen. In fact, according to collectors and experts, upwards of 90 percent of all canvas decoys made anywhere hailed from northeastern North Carolina and southeastern Virginia, with particular strongholds in Currituck, Carteret, Dare and Hyde counties.

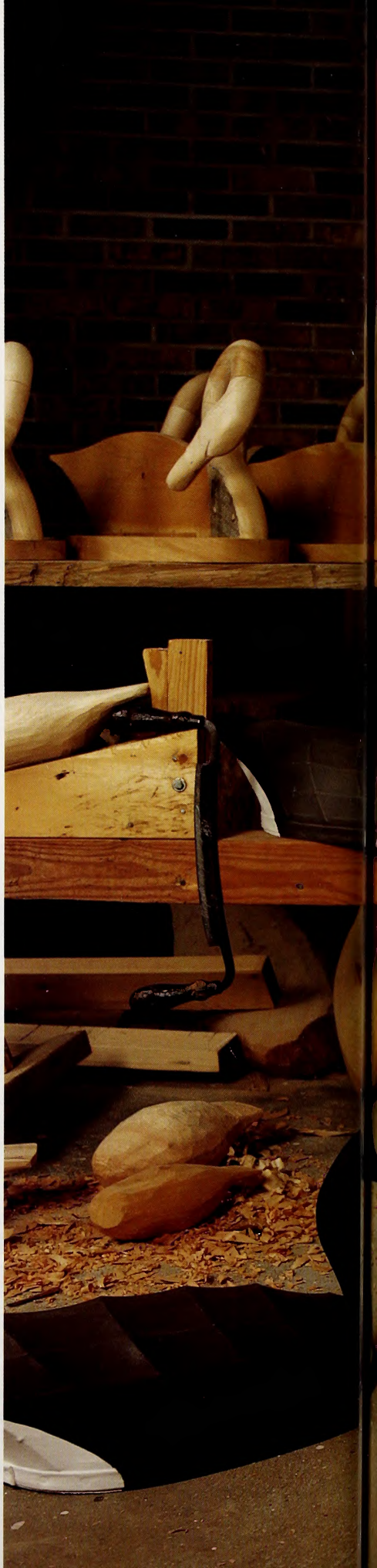
Along the mid-Atlantic coast, the earliest-known canvas decoys seem to be from a rig of Canada geese made by Tilman Lewark of Corolla around 1900, according to Archie Johnson, a Tidewater decoy collector and co-author of *Gun Clubs & Decoys of Back Bay & Currituck Sound* (see review on p. 30 for details). While other examples of the construction style exist, early 19th-century gunners along the North Carolina and southern Virginia coasts didn't need large decoy spreads—at least not the kind of decoys used today. But larger rigs would soon be necessary, and hauling five dozen heavy wooden decoys to the blind and back was impractical, especially if a gunner's boat was driven by sail.

In those days, according to Dr. Neal Conoley Jr., author of *Waterfowl Heritage: North Carolina Decoys and Gunning Lore*, rampant baiting had as much to do with the scarcity of decoys as a lack of materials. "They didn't need as many decoys when they baited the shoals and marsh ponds," he says. "They'd rather have corn in the boat than decoys!"

The 1918 Migratory Bird Treaty changed all that, and ushered in a new era of decoy making along the North Carolina coast. No longer could gunners spread corn instead of decoys; no longer could market hunters sell boatloads of birds, at least not legally. Decoys —and lots of them—were now required gear for successful gunning, and the shift from duck hunting to goose hunting began. Those changes ushered in the golden age of the canvas decoy.

Waterfowlers along the Carolina and Virginia coasts now needed decoy spreads that numbered in the hundreds of blocks. As geese began to winter in the area in ever-increasing numbers, decoy makers honed their styles to build even bigger decoys. The evolution of the canvas goose decoy—a flat-bottom, wire-ribbed, canvas-covered shell—now so closely associated with coastal North Carolina gunning, began.

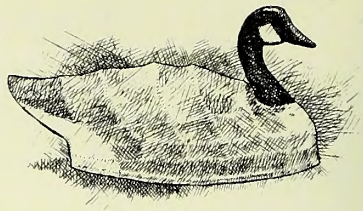
To meet the demand, says Conoley, just about every duck and goose hunter tried his had at decoy making, using whatever material was on hand. Nick Sapone, a highly regarded decoy maker from Wanchese, N.C., says many old canvas decoys he's repaired were made from familiar old blue-striped pillow

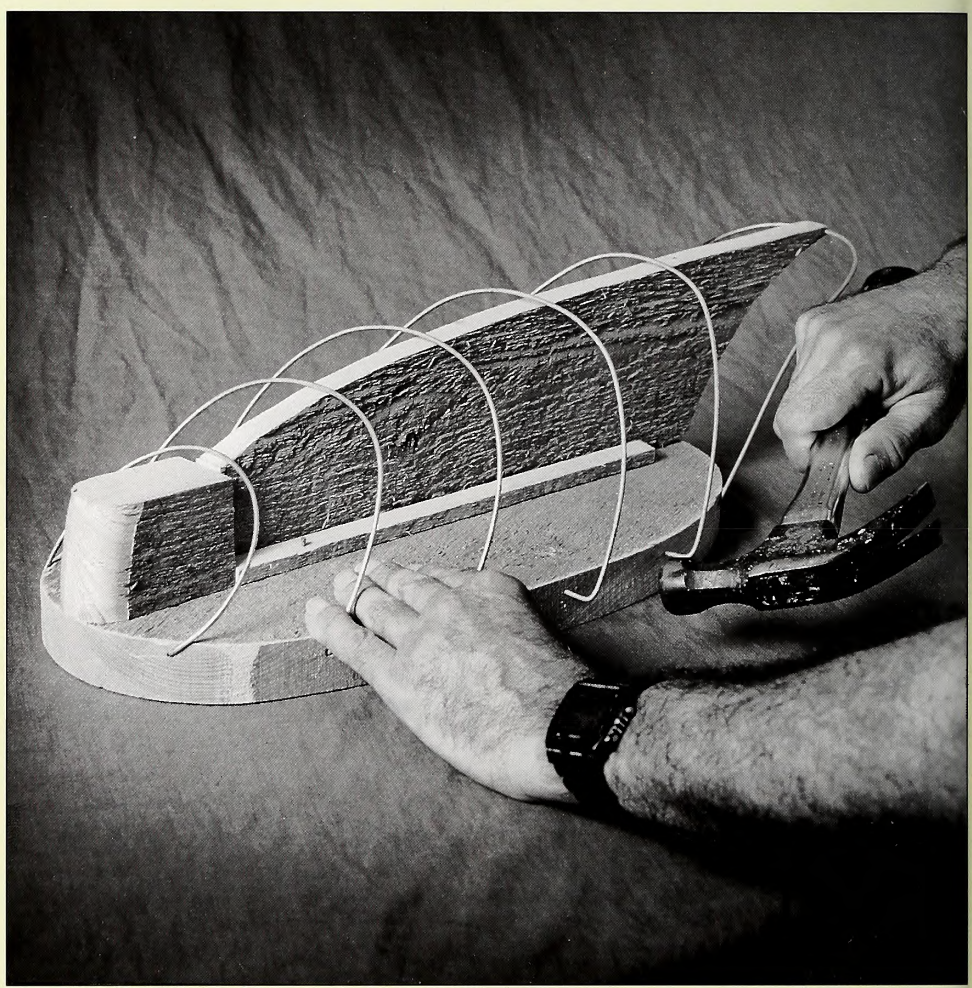


***Nick Sapone is a modern master** of the art of building canvas decoys. Long before the advent of lightweight plastics, these canvas imitations allowed waterfowl hunters to transport and use large spreads of decoys.*

SN

# *Making a Canvas Decoy*



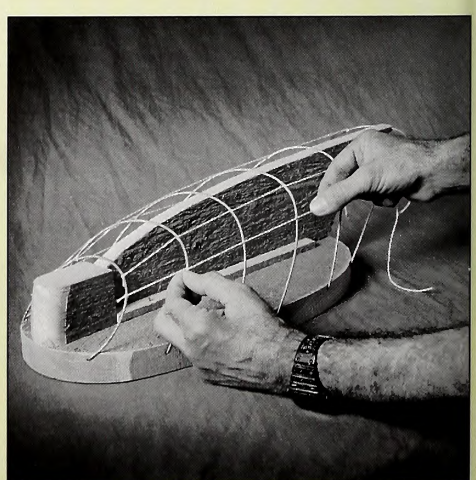


***Step one:***

Carve head and neck. Assemble body parts in following manner. With knife, round off top of pedestal block and nail to bottom board, from the bottom, using 8-penny nails. Place centerboard in middle of bottom board, snug tightly against pedestal block, and nail one chock strip in place using two (2) 1¼-in. finish nails. Mark location of second chock strip, remove centerboard, and nail in second chock strip. Place centerboard in the groove, snug against the pedestal block. Centerboard should be held rigidly in place.

***Step two:***

Attach body wires. Start with No. 1 wire, or breast wire. Drive wire ends into the bottom board with claw hammer. (Wire ends of No. 1 wire should be bent at 45-degree angles toward the tail to facilitate asembly.) Make sure the No. 1 wire clears the back edge of the pedestal block. Lay out remaining wires to even placement, maintaining the flow of the body shape. Drive in all wires on one side, then drive in wires of other side. Note that the No. 5 and No. 6 wires are bent taller than the others, to form the tail shape. The No. 6 wire should fit snugly into a notch carved at the tip of the tail. (See detail.)



***Step three:***

Attach strings to wires. Begin with clove hitch at breast wire, then loop string *over* each wire, pulling snugly between each, and tie off at tail wire with loop and clove hitch. Tie three (3) on each side. Snip off excess strings.

### *Step four:*

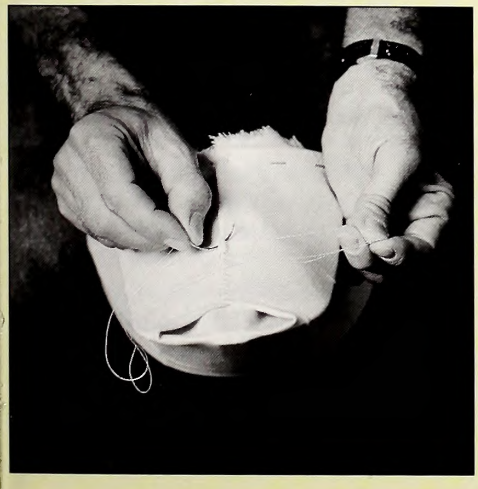
**A:** Attach canvas. Center large piece of canvas over body, stapling once at tail, breast and both sides, keeping canvas snug and wrinkle-free (staple once vertically in the center of pedestal block).

Grasp excess under breast with one hand, and staple canvas to bottom board, beginning at the midway point on the body and working toward breast, alternating sides, being careful to pull out wrinkles evenly on both sides.

**B:** Fold excess canvas at breast like finishing off a wrapped present. Fold right flap across breast, staple vertically along centerline. Cut off excess canvas tag end. Fold other side over to form a V at top, cut off excess and ½ inch beyond centerline. Fold that ½ inch under and tack to form a straight, finished, Y-shaped seam.

**C:** Flip over to tail end, repeat folding maneuver: Staple back to tail wire, then stop. Fold over one flap of canvas, continue stapling to seam to hold in place. Cut off end of flap, leaving 1½-inch tag end beyond centerline. Repeat with other side of cloth, tucking tag end under for vertical seam in center. Staple to the bottom board to complete stapling entire bottom board circumference.

Sew (instead of tack) to form a Y-shaped seam, pulling canvas snug with stitches.



### *Step five:*

Attach bottom band. Trim all excess cloth ¼ inch above the bottom edge of bottom board. Take band of 45-inch canvas, fold lengthwise by thirds to form a finished upper and lower edge. Starting at tail, tack around circumference of bottom board at approximately 1¼-inch intervals, covering the staples and ragged edge of body canvas. Be sure to keep bottom edge of band approximately ⅛ inch from bottom edge of bottom board. Fold last inch of band under and tack for a neat finish.

### *Step six:*

Paint body one coat. (This will "set inch the canvas and ensure a wrinkle-free breast when attaching head.) Paint tail white and body brown. For the breast, mix a little brown with white to form a buff color.

### *Step seven:*

Attach head. Cut out a ⅝-inch by 2-inch patch of canvas from the top of pedestal block. Drill ¼-inch hole up through neck and into head, matching hole 1 inch into pedestal base. Test for alignment. Affix head to body with dowel and wood glue. Drive two (2) 1½-inch finish nails through the front of the neck and into the pedestal block, and one (1) 1½-inch finish nail through rear of neck and into pedestal block.

### *Step eight:*

Exterior finish. Shellac wood bottom and head. Attach eyes. Paint head and neck, paint bottom brown, paint second coat of body. Drive nail in breast and attach small piece of anchor string.

### *Step nine:*

Add water and reed-lined shore, stiff northeast wind, the smell of wet dogs and marsh muck oozing around your wader boots. Look north. Don't move! *Geese!*

## Tools and Materials

Band saw or coping saw
Power drill
Sharp knife
Claw hammer
Tack hammer
Electrician's pliers
Staple gun with 5/16-in. staples
Paintbrush

### *Body parts:*

Bottom board—Semi oval, 8¾ in. wide by 17 in. long, cut from 1¼-in. to 1½-in. juniper plank

Centerboard—Shaped like a side-view silhouette of a goose body (see photographs), cut from ⅜-in. to ¾-in. juniper plank; tail height: 4½ in. height at base of neck: 2¼ in.

Centerboard chock strips: Two (2), cut from approx. 1½-in. by 1¼-in. wood strips, 12 in. long

Head—Cut from 1½-in. juniper board. Height: 6 in., including neck

Head pedestal block—Solid block of wood, 2¼ in. by 2 in. by 3½ in. long

### *Body wires:*

Six (6), cut from 12-gauge galvanized wire, in the following lengths: 12 in., 13½ in., 15 in., 16 in., and 17 in. With electrician's pliers, make a ½-in. right-angle bend in the ends of each wire. Shape wires to approximate the shape of a goose body (see photographs).

### *Other:*

White canvas, 16-in. by 30-in.
White canvas, 45-in. by 1¾-in.
Two (2) 8-penny anchor-fast nails
Four (4) 1¼-in. No. 3 finish nails
Three (3) 1½-in. No. 3 finish nails
Ten (10) ft. of butcher's string, or any strong string
¼-in. dowel, 5 in. long
Approx. 36 No. 14 galvanized carpet tacks
Two (2) brown glass eyes, 11 mm
Curved sewing needle
Extra strong hand quilting thread
Shellac
Elmer's Professional Carpentry Glue
Oil paint in flat black, white and brown
Thinner

***Although mostly used** for decorative display today, some decoy aficionados still hunt over this traditional design. Canvas decoys were once widely used in northeastern North Carolina.*

ticking. According to Johnson, many early canvas birds were framed with copper wire salvaged from old U.S. Lifesaving Service communications lines that ran up and down the barrier islands and were vulnerable to every strong storm that passed through. While each maker brought to the form his own ideas, a sort of regional decoy style began to take shape in the canvas Canada goose decoy of the North Carolina shore. And along the way, the hunters and decoy makers found that canvas decoys worked as good, if not better, than their wooden counterparts.

For starters, says Conoley, canvas goose decoys float better and higher than their wooden counterparts. The flat bottomboard has so much surface area that decoys hold to the water and don't pitch and roll in heavy chop. And because they're so light, the birds have plenty of decoy action on even a light wind. "They just *look* like a goose on the water," says Conoley.

Sapone agrees. Having demonstrated by invitation the art of his craft at the Smithsonian Institution, the cheery former tugboat operator has made a name for himself as a contemporary maker of decoys in the traditional gunning style. In his workshop, Sapone crafts dozens of decoy styles in both canvas and wood, but he is known as a master of the canvas decoy. He makes swans and Canada geese in a variety of silhouettes: sentinels, sleeper, feeders, hissers. He also crafts ducks in canvas; his head-up canvasback is a beauty. In his showroom above the workshop, decoys are draped with blue and red ribbons won at various decoy shows. There's a canvas swan that took first place in species and division at the 1991 Core Sound Decoy, second in show at the 1991 Currituck Wildlife Festival. And those are the accolades draped over the back of a *single* decoy.

"I've honed in on the gunning style, which is a relatively simple carving and painting style," Sapone says. His canvas Canada goose design is steeped in the history of honkers in the marshes around his Roanoke Island home. In the early 1980s after he'd started carving wooden decoys, a relative gave him a dilapidated old canvas goose decoy that her husband had hunted over. "I was going to rebuild it," Sapone recalls, "but after studying it for a long time, I thought no, instead of wrecking this old decoy I'd try to make one just like it."

Since then he's fine-tuned his design to the award-winner it is today. But not all canvas decoys were fashioned in the wire-framed manner as those so popular in North Carolina. In Massachusetts a decoy maker named Joseph Lincoln became well known for his "slat geese," which boasted barrel slats for body supports instead of wire. Johnson has written that decoy makers in the Midwest and on the West Coast routinely fashioned decoys from canvas shells stuffed with cork, kapok, corn and cedar shavings. Commercial manufacturers used printed canvas to cover block cork decoys as late as the 1940s. Thirty years before, a Chicago manufacturer of canvas decoys offered a mallard decoy with a printed canvas cover stretched over a body and head frame made completely of wire.

Whatever the configuration, however, collectors today haven't taken to canvas like gunners did in the 1920s, '30s and '40s. It seems the love of canvas decoys is something of an acquired taste. The cloth birds have never been collected with the fervor that surrounds their wooden brethren, and prices for canvas decoys have changed little in the past five years. In fact, a canvas bird made by an acknowledged master such as Ned Burgess or Mannie Haywood can still be had for $250 to $350, says Johnson, far below the prices commanded by the carvers' wooden birds.

"Canvas decoys are very regional in nature," Conoley explain, "and that's held back their collectibility. And some people feel they don't take as much craftsmanship to make as a wooden decoy."

But watch Sapone at work and the notion that art is absent from the process of canvas decoy construction is swiftly put to rest. He builds his birds from the inside out, shaping the skeleton of wires with the palms of his hands. He sits in a rusty chair with the decoy shell held tightly between his knees, snugging the tight canvas over the thin ribs, muscles and tendons rippling in his forearms.

Indeed, try to make a canvas goose yourself and you'll quickly learn that art and craft—as much as patience and persistence—have much to do with the making of a canvas decoy. Canvas decoys still earn a hallowed spot on the mantel, but they also have a place in the field. Johnson and Conoley hunt over canvas Canadas, and a canvas swan or two feeding near a decoy set is as good—and as historically appealing—a confidence decoy setup as you're likely to find.

The most difficult aspect of making a canvas decoy, says Sapone, is getting through the first bird. "Overall, this is not a hard decoy to make," he says, "but it is difficult to learn the techniques and to manipulate the string and the wires and the canvas to get a good final product. Once you get past the learning procedure, they are not as hard to make as a wooden decoy. But it is *still* a handful."

On the preceding pages, Sapone demonstrates what it takes to turn canvas and wire and string and wood into a work of North Carolina heritage. And fear not, he says. "After the first dozen or so, they'll look better!" ☒

# Private Water

## A tale of greed and redemption.

written by Vic Venters
illustrated by David Williams ©1992

I suppose I shouldn't complain . . .

After all, people pay good money and languish on waiting lists to join trout clubs where every fish is 15 inches or better and catching four or five trout over 20 inches is not only possible, but expected.

I was never a member of Private Water, mind you. Only a lucky guest.

Before I fished it, I had heard about this particular stream for years. Dreamed about it actually, or about the fish in the stream, more specifically. They were huge—*Salmo leviathanus gigantus*. You could catch big browns and rainbows, members said, until your arms fell off from fatigue. "Fish here," one member sniffed, "and you'll need that backing on your reel." The stream record, I recall, was a big brown that went over 34 inches. The rainbows didn't run much smaller.

Of course, trout this large aren't a normal occurrence in our protein-lean Appalachian freestone streams. These fish were fed a supplemental trout chow diet and protected from

poachers by a shotgun-toting riverkeeper. Their supplemental diet didn't matter to me much at the time and I rather liked the shotgun business. I had fished over wild, but fed, trout in a public stream before and found they could be every bit as challenging as non-fed fish, at least from a technical standpoint. These trout would be no different, only bigger, more plentiful. But to get at them? Even if I could afford the membership dues for Private Water, I had no social connections.

That is, until Johnny joined the club. We'll call him Johnny, anyway. It was something of a surprise. Johnny is a purist—no, make that traditionalist—in the best sense of that word. Big stream, small stream, he fishes wild trout only, preferably those rising to a dry fly, although he isn't so pretentious that a nymph or streamer won't do if the fish aren't cooperating. Unlike myself, Johnny is no yuppie fly-boy wannabe; he's honed his trout fishing skills over three decades on remote mountain waters. His mentors were mountain men—strictly Appalachian old school—and he speaks of his favorite streams like the French speak of food. Catching wild trout is something to be savored, to be treated reverentially. Johnny never had much use for fed fish, however large. "But I could use some photos," he admitted.

*Maybe*, I thought. *Just maybe.* I awaited the news of his first trip to Private Water with all the patience of a New York City cab driver. "How many?" I blurted when he returned.

"Purina trout," he said with a faint smile. He didn't look impressed.

"Purina what?"

"As in hatchery fish."

I didn't believe him. "What do you mean Purina trout?"

"It was like fishing the hatchery run up at Pisgah Forest," he said. "You couldn't have kept'em off with a baseball bat."

"Wha'cha use?"

"Glo-balls!"

*Glo-balls?* I really should have caught on then. Glo-balls, which imitate the pickled salmon eggs used by bait fishers, are trout flies, but only in a matter of speaking. They are made of yarn and are tied, even if the material is synthetic and fluorescent orange. But not something a traditionalist would normally use on a worthy opponent. Of course, it didn't matter to me what he used. My aesthetic tastes are, after all, rooted in the latter half of the 20th century, not the first. Anyway, it was legal.

When he finally asked me to come along, my reaction must have resembled one of those little horny-head suckers tossed up on the bank, mouth twitching and popping. "I'd be delighted," I gasped. I don't think he saw the slobber.

We went up in mid-week, and found that we had Private Water to ourselves. It was a medium-sized stream, with moderate gradient, lots of pools, deep runs and fishable riffles. Dry fly-water galore, with plenty to keep the nymph fisherman happy, too. And the trout. Perfectly splendid m-o-n-s-t-e-r-s. I could see them in the homeplace pool, where no fishing is allowed, dozens finning about, lurking, big as August watermelons. Best of all there was no one, absolutely no one, to share them with.

Johnny and I began by leapfrogging pools, he fishing those most suitable for dries, while I raked the faster water with weighted nymphs. Success was instant, first on 15- to 17-inch fish, then larger ones. How could it not be? Johnny's earlier description—a "hatchery run" —was no exaggeration.

My approach, my casting, quickly became measured and calculating, like a heron stalking the shallows for sunfish. *Where is the biggest fish in this pool?* It did not take long to begin skipping the marginal water—which still held nice fish—to concentrate solely on the heavy white water plunging in at head of each pool. This is where I knew the big browns and

rainbows would be sulking in a slow-water cushion at stream bottom, holding deep under a lair of fast, frothy water.

To fish this kind of water, grace and style are optional; lead is not. My stonefly nymphs were so heavily weighted that they resembled jigs, not flies. The fish blur together but I remember one. I lobbed the nymph straight into a plunging cascade that swept down a small set of falls. The water pushed the fly to the bottom, then swept it back 3 feet when the indicator stopped. I struck. The old brown did what big fish do, namely ripping up and down the length of the pool several times, then making a determined run out of the tail of the pool, over several rapids, through some riffles, running just beside—instead of under—a fallen log (thank goodness) before finally bulldogging to the bottom of another deep pool 50 yards below me. I won't bore you with all the details but he was eventually subdued and released, like all the others. And yes, I did need my backing.

*"The Private Water I once fished also offered an illusion—that of a functioning trout stream."*

Johnny finally pulled me off stream in late-afternoon; there was an expected sulphur hatch on the creek in front of his cabin. The wild stream-bred browns—small fish mostly—would be starting to rise for the tiny yellow mayflies. For Johnny, the day was beginning; for me, it might as well have ended. He didn't say much on the drive back, only that he didn't think he got the photos he needed and we'd have to come back. For what undeserved reason, I wondered, had I been so blessed?

My second trip to Private Water was much like the first, an almost bacchanalian frenzy of flies and fish. Johnny fished some but concentrated on photos. I suspect he enjoyed catching these behemoths, though much in the way one might enjoy a mud-wrestling contest. It's not the kind of thing you admit to.

On my third trip, however, I began to notice things: trout with stunted caudal fins, missing gill plates, misshapen jaws—genetic defects from hatchery birth, not battle scars from angling encounters. There was that 17-inch hatchery-strain brook trout, fat from trout chow, but pale and bloated like a piglet with fins. And there were pools where trout foul-hooked themselves on our flies as hordes of fish rushed the artificial morsels in greedy competition.

There were some wild fish, granted, and beautiful ones too, but the owner of the place dumped hatchery fish in by the truckload every year. The innate superiority of wild fish to establish stream dominance was swamped. Consequently, all the fish were big and strong from their trout chow diet, but they rarely looked healthy. Like hatchery fish.

On the fourth trip, I found tires in the stream, and cans and soda bottles washed down from a town upstream. They had always been there, of course; I just hadn't noticed them before. Powerful thing, greed. The water was always somewhat dingy, too, even if it hadn't rained in weeks. In many pools, the bottom was covered in silt and sand, not gravel.

By the end of the fourth trip, the bloom was coming off the rose. The realization wasn't anything sudden, like a balloon popping, but was more like finding a basketball with a pin-hole leak. You pick it up, it looks okay, then try to bounce it. *Pluump*. I understood, at that point, why Johnny had used glo-balls on these fish. It was like using crickets on bream or doughballs on carp. You just did it. That trip was several years ago and I have not returned to Private Water.

I am kneeling in a small headwater creek somewhere in the South Toe River basin area. In my hand is an 8-inch wild brook trout. I hold it gingerly, like a small antique doll, its body just under the crystalline water that flows over its head and through its gills. I swash it back and forth in the current, not only to revive it, but to admire its beauty. The brookie fell for a size 14 Royal Wulff, a sort of white bread of trout flies.

This small native was probably the biggest brookie in the tiny pool from which I caught

it. Its rise to my fly hadn't been particularly selective, nor was its battle in any way epic. A splashy little affair, a few jumps and pint-size runs around the pool, then I had it. But there is more to a fish's worth than the amount of backing it can strip from a reel.

The difficult part had begun three hours ago and a mile down the creek where I had parked my car on a gravel Forest Service turnoff just past the bridge that crosses the stream. Alone, I hiked the creek, following a fisherman's path up a narrowing defile. The first quarter mile had been easy, the slope gentle, the path well-defined. I resisted a magnetic urge to fish the wild rainbows and browns in the pools beside me.

Gradually the path narrowed, the climb grew steeper. Overhead, a canopy of green closed above me and rhododendron blocked my path. I went around it at first, then under. The creek began to staircase up the slope and the trail disappeared. My hike became a climb. I stopped to take the reel off my rod—no need to crush it. I pushed on. There would be brook trout waiting.

An hour's climb seemed to yield only pitiful yards, but when I heard the waterfall ahead, I knew I had come far enough. I pushed my face under a small cascade to wash the bugs and sweat from my eyes, then peered over the polished rim of a pool. Ahead, two car-sized pools were linked by a small cascade, then followed by a larger pool into which poured a waterfall from 20 feet above.

Each would surely hold trout, the pools large enough to provide year-round sanctuary from the scouring flows that surely come with heavy rain. A few gray caddis were coming off the first pool but no riseforms followed. A juicy-looking fly should tempt something. I tied on the Wulff, then flicked it into the current near the plunging water. The brookie took as the fly floated past a rock.

The fish is now fully revived and tugs in my hand. I open my fingers and the brookie fins slowly to the stream bottom, the gold vermiculations on his olive-green back melting into the brown and tan gravel. It settles in at stream bottom, like a man adjusting his body on an easy chair, and disappears—almost. Its camouflage, an illusion of light, color and water, is perfect.

It's been noted that the brook trout is symbolic of the fate of the Southern Appalachian wilderness. Once found throughout the mountains, today the species hangs on only in pockets where the cleanest, coldest waters are found and where logging, roads and towns are not.

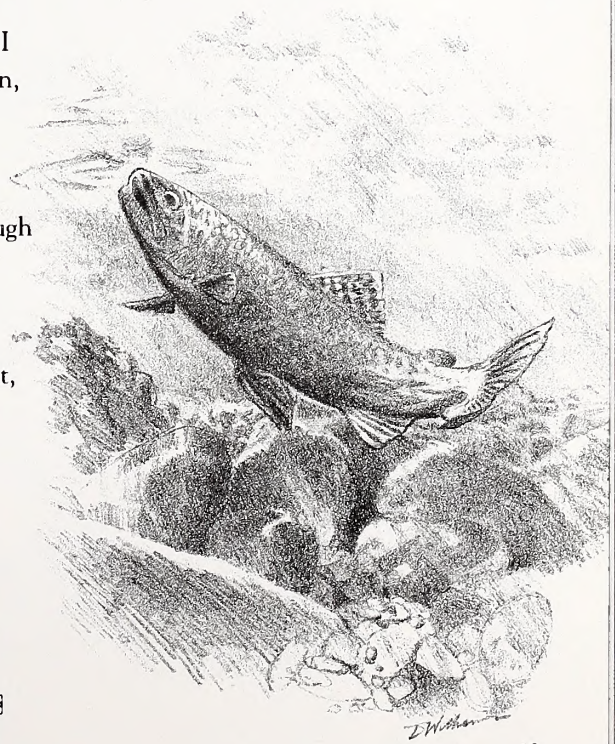
To me, this brook trout and the protected headwater creek in which it swims, offer a welcome illusion of wilderness. This is my perception only; I can hear no cars from where I sit, walk no path, see no people. Over the ridgeline, however, reality waits—maybe a town, a condo development, another river running muddy from deforested slopes.

The Private Water I once fished also offered an illusion—that of a functioning trout stream. The difference in the two illusions was that the one offered by Private Water was entirely mythic, like a store-bought version of those perfect trout streams that flow through our minds, where every cast yields a perfect rise and a huge fish. For the trout and other streamlife up on this untrammeled headwater, however, its existence provides not only illusion for man, but a very real sanctuary for wildlife.

In truth, though, I learned on that particular Private Water not what was wrong with it, but what was wrong with me and my conception of trout fishing. The Private Water was merely the canvas on which all my avarice and self-pride was splashed in full color.

Now, as I stare at the resting brookie up here, I feel I'm a better fisherman, even a better man; that my greed and foibles have been washed downstream along with the rest of my daily cares. Perhaps I am redeemed, although my new-found purity is maybe but another illusion.

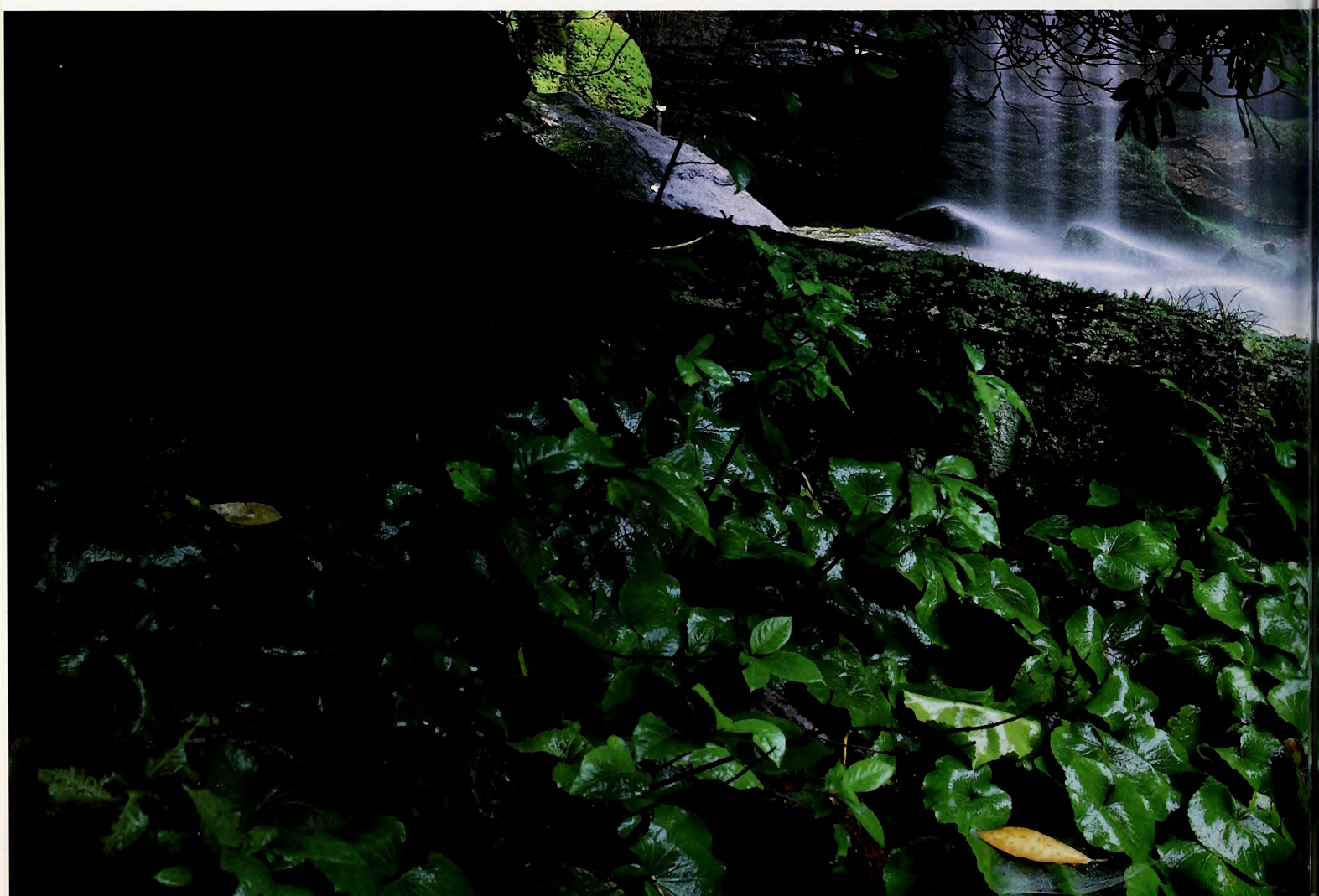
I fish the next two pools as the sun sinks beneath the ridge; suddenly it's colder, much darker. The day is closing in on me, and the canopy of green above seems to draw closer. It's time to go. I turn and begin to clamber down the rocks, to what waits for me below. ☒



# *Wide-Eye*
# ON NORTH CAROLINA

Photographer Ken Taylor uses the 110-degree angle lens of a panoramic camera to capture a unique view of natural places and familiar landmarks.

photographed by Ken Taylor



*Black River, Pender County*

*Panthertown Valley, Jackson County*

Who says landscape photographs have to be locked into 8-inch by 10-inch frames, or even 1-inch by 1½-inch frames, the dimensions of a 35 mm slide? Why can't landscape photographs be circular, or square, or even long and skinny like . . . well, like landscapes?

Thanks to the panoramic cameras now wielded by professional photographers like Ken Taylor, familiar landscapes are taking on a new, wide-view look. It can be appropriate to some landscape subjects, such as seascapes or views of Pilot Mountain from a cornfield below. The camera's breathtaking 2½-inch by 6¾-inch negative enables it to exclude parts of scenes that are unnecessary. By contrast, an ultra-wide angle lens on a 35 mm camera often includes wide areas of empty sky or distracting foreground clutter.

You could put a down payment on a house with what it takes to buy a professional panoramic outfit, but Kodak makes inexpensive cameras with the panoramic eye. Or if you feel like being a couch potato, enjoy the pictures Ken takes in the pages of *Wildlife in North Carolina*.

*Pilot Mountain, Surry County*

*Atlantic Ocean*

# Love Letter to a Canoe

A canoe is the most versatile, enjoyable craft afloat, and you need one even if you don't know it.

written by Joel Vance ©1992
photographed by Soc Clay ©1992

Philosopher Sigurd Olson once wrote, "I have set my canoe on singing waters." No one ever implied the lovely relationship between canoeist and craft any better.

No doubt the first Native American to slap some birch bark around a crude stick frame was only looking for a way to get across the river, but what he created was enduring art.

The unique canoe is as entwined with American transportation as the Model T and has endured a heck of a lot longer. No one would maintain that a bass boat or a johnboat has soul, but you have to hesitate before denying your canoe that special character.

Canoes get to you. They're like Old Shep, a faithful companion that does what you tell it to without fuss and that carries you to places you otherwise never would see.

I've slept in and under mine, pushed it up

tiny creeks that harbored smallmouth bass who'd never seen a lure, watched from it as an eagle fed its young, leaned against it to eat a campfire-cooked dinner, arms pleasantly aching from a day of paddling... and turned it over in icy water, wondering what I'd done to offend it.

My whitewater days are, I hope, behind me. I've flipped canoes and kayaks enough to feel that the odds are shortening. I've lost my enthusiasm for life-threatening situations. Forget the Nantahala or the Chattooga. Give me a Class One or Two stream, with lazy pools and the occasional cough of rapids to spice things up.

Today's canoeing magazines concentrate on speed and thrill to the virtual exclusion of the family canoe. High technology has taken over, and old war-horses, like the two in my stable, are consigned to the glue yard.

But I'm happy with a vintage Grumman and a heavy Old Town. They're broad and stable and hold me, my gear and a bow paddler on quiet rivers whose only real threat is an overdose of pleasure.

Rivers pulse with life, the arterial flow of the land. I've canoed into remote Canadian lakes, where the water lapped lazily at the shelving granite rock of the shore, and that form of canoeing has its wonderful charm—but a river is a constant mystery, shrouding itself in bends and backwaters.

It picks itself up in the riffles and tries to run away from you, and challenges you with the deep mystery of its pools. Kingfishers dip and chatter back and forth across the river, like sideshow barkers announcing new delights just ahead. Wood ducks skitter

***While a stretch** of raucous whitewater is an exciting challenge for a canoist, many paddlers prefer to explore smaller streams. If the water isn't too low, there is endless delight in gliding through the pools and bouncing down gentle riffles to see what kinds of wildlife await around the next bend.*

***Because it can be easily*** *carried into out-of-the-way waters, a canoe is nearly ideal for the angler who seeks solitude and good fishing beyond the reach of noisy outboards.*

ahead, squeeping panic. Lordly blue herons lift with ponderous dignity. The occasional deer, hock-deep, gazes at you with caution, wondering what strange new driftwood the river has brought it.

Too many rivers are defiled by polluters and those who want to beat nature into submission. Too many rivers have become sewers or scars on the landscape. My consolation is that the world has been around longer than those who ravage it and it can recreate itself, given time.

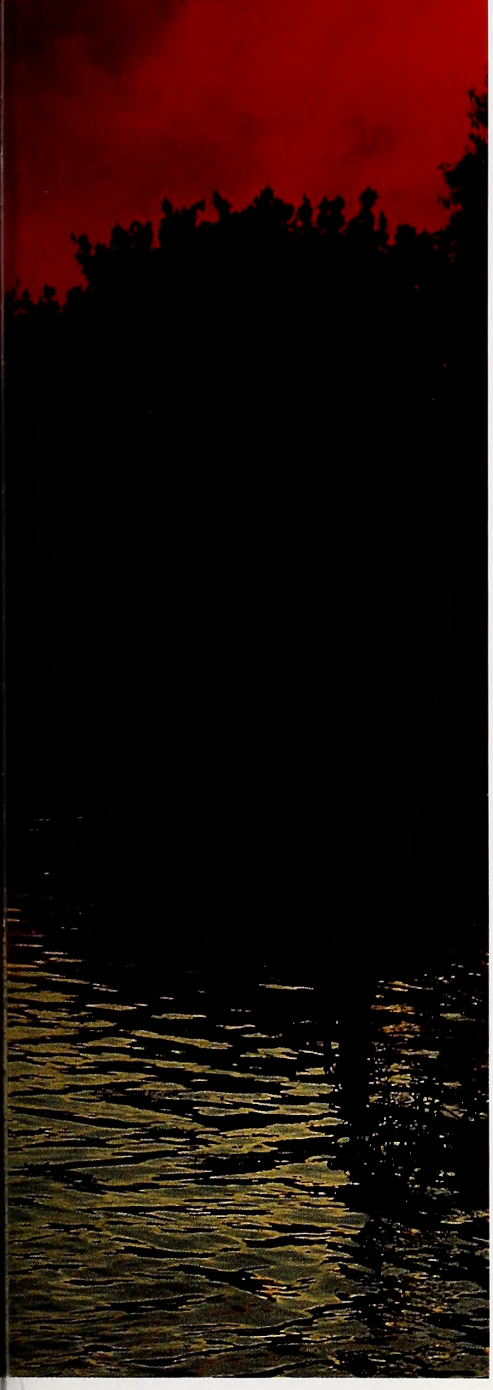
My late friend Charlie Schwartz, illustrator of Aldo Leopold's *A Sand County Almanac*, made a river a two-way street for me. "Get a pole," he said. Charlie, as a boy, would launch his canoe in the Meramec River near his St. Louis, Mo., home and pole upstream, then float back down, a week-long trip.

He'd learned poling from an old expatriate canoeist from New England where the skill was as old as the colonists.

Few people pole canoes today. It's an esoteric art, not a matter of strength. Poling has the elements of fencing, a delicate thrust-and-parry. You beat the river at its own game, using currents and eddies to maneuver up rapids and through pools.

I started with a fir closet pole 11 feet long. Today, my pole is a similar length of tempered 1-inch-diameter aluminum.

Those who pole where the bottom is soft use a "duckbill," a pair of flaps that open like the mouth of a duck to push against the bottom. Wooden poles usually have a spike in the end (I screwed a big lag screw into my closet pole and sleeved the last 6 inches with aluminum conduit so it wouldn't split).



Most canoeists think standing in a canoe is about as hazardous as walking a high wire blindfolded, but it isn't. Just as a high wire walker uses a long pole to give him balance, so does the poler. Poling is easy—plant the pole slightly behind you and push, hand-over-hand, to the top.

Flip the pole up and forward and do it again. You steer by where you plant the pole or by pushing or pulling sideways against it when it's planted.

You can alternate sides and you can use the pole like a kayak paddle in water too deep for poling. You climb rapids through the eddies as much as possible, saving your strength for pushing through the fast water with short, quick jabs. Sometimes a rapid simply is too strong and that's when you learn the dubious joy of portaging.

# New to Canoes? Try These Tips.

## Family Canoe Accessories

*Paddles:* Plastic paddles are cheap and durable. A paddle standing on end should reach about to your collarbone. Paddles too short overwork you. "Bent" blade paddles maximize your paddling energy (the bend goes *forward* when you're paddling, not back).

*Life Jackets:* (Personal flotation devices or PFDs): Mandatory for any non-swimmer and all children. Best are the close-fitting type that aren't bulky. Some use a gas-filled cylinder that activates to fill the vest when you pull a cord. A child's version inflates automatically if the vest is submerged. Boat cushions are a waste of money and probably are dangerous in that if you flip, you won't be able to grab one in time.

*Dry Packs:* It is essential to keep some things dry—spare clothing, cameras, bedding, etc.—and various commercial dry packs work well. But I've used heavy-duty garbage bags stuck inside a backpack and tightly cinched at the top. The backpack is fastened to the thwarts and is easily carried on portages or when unloading or loading the canoe. A friend uses plastic bags that fish hatcheries use for shipping fish—obviously watertight. Army surplus stores carry .50-caliber ammo boxes that are excellent for cameras, billfolds, watches and other small items.

*Other Items:* A carrying yoke is helpful for portaging or carrying the canoe to and from the car. You can fashion one by lashing two paddles to the forward thwart so the blades rest on your shoulders. Some paddlers like a back rest, so a boat seat or canoe equivalent is helpful, although I don't like them. A large sponge or plastic bailer (made by cutting a plastic jug into a scoop-shape) helps get rid of water in the canoe. A folding camp table makes a deck to keep gear out of water and also serves at the campsite.

## A Guide to Buying Canoes

The best reference is the annual *Canoe-Sport Journal* canoe buyer's guide, available from CSJ, Box 635, Oscoda, MI 48750 (Tel. 517-739-9997) for $3.95. Subscriptions to the quarterly are $12.50 and the subscription address is American Canoesport, Inc., Box 991, Odessa, FL 33556 (Tel. 813-938-6191). The only problem is that there is so much information, it can confuse a neophyte buyer—but better too much than not enough.

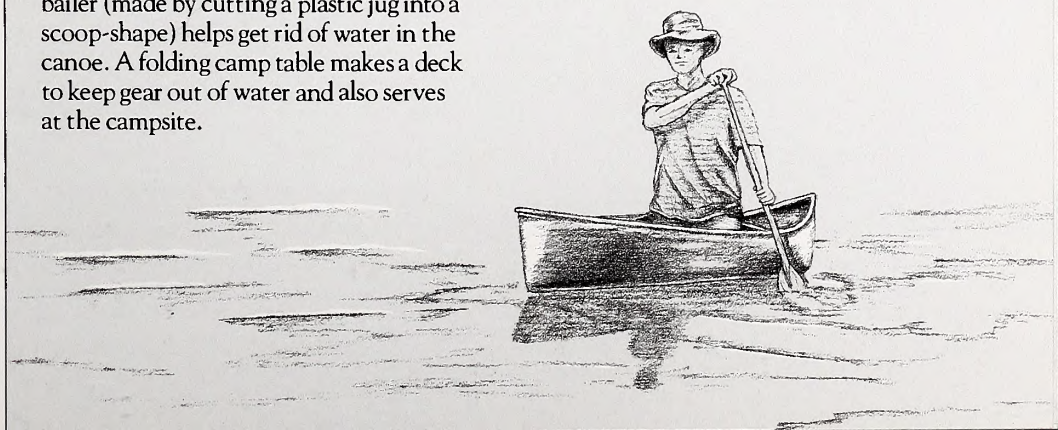
## Hauling a Canoe

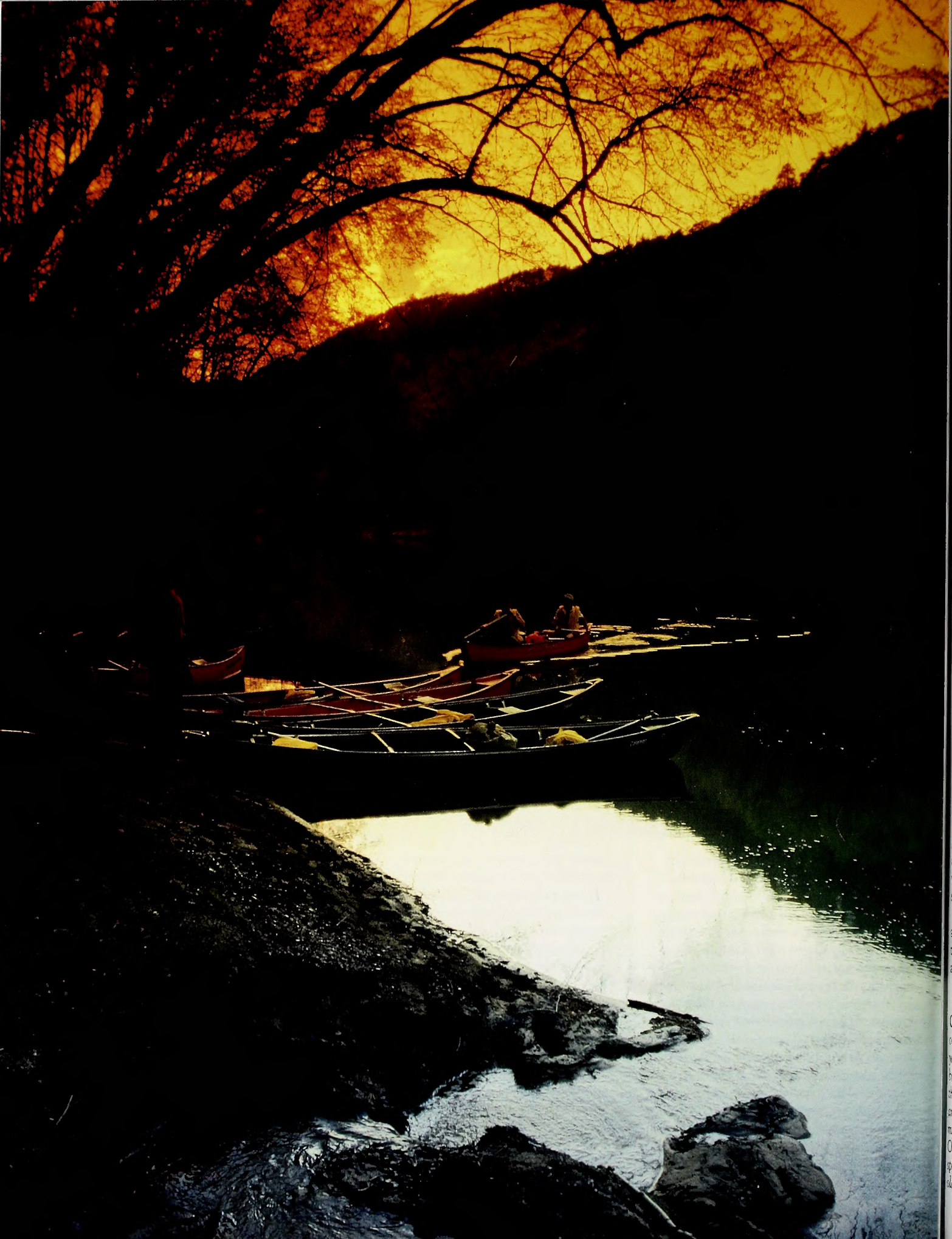
Most canoes are "cartopped." There are many good boat carriers; opt for those that fasten to the rain gutter and avoid those that use suction cups or otherwise can mar the roof. Foam blocks that slip onto the gunwales are inexpensive and work fairly well for one canoe.

My fastening system is mine (there are many). It is reliable. I use two 20-foot pieces of either ¼-inch or ⅜-inch nylon rope, passed through the bow and stern eye-bolts, holes or whatever other provision the canoe has for attaching a rope. A single overhand keeps the rope equally divided, 10 feet to a side. Some autos have metal straps with holes in the front and rear.

I fasten the canoe fore and aft, right and left, with a knot arrangement that can be dogged down tight so the canoe cannot slip (see diagram).

And don't forget a strap or safety rope across the top so even if a front rope snaps, the top rope will hold the canoe in place.





***Despite their light weight*** *and fragile appearance, canoes are tough and capable of carrying heavy loads. This versatility makes them nearly ideal for long floats and comfortable overnight camping.*

A friend is a world-class flat-water canoe racer. He's built like a wedge and thinks nothing of flipping a 60-pound canoe onto his shoulders and *running* a quarter mile, much of it uphill or down steep embankments, but I approach canoe-carrying the same way my sons approach lawn mowing.

Lake canoeists learn paddling teamwork and a sweet, tireless rhythm that eats the miles. The stern paddler calls a change in paddling side at the beginning of a stroke and as the bow paddler finishes, he flips the paddle to the other side for the next stroke, as the stern paddler does the same.

Good paddlers can carve a straight line across a lake as if a surveyor had laid it, never wasting energy or forward motion to make steering corrections.

Most canoes today use modern materials—aluminum, fiberglass or plastic—but there is a thriving cottage industry in the manufacture and repair of old wood/canvas canoes, those lovely creations of Old Town, Peterborough, Rushton or E.M. White from the turn of the century.

Those aren't "family" canoes—they're too precious. Using one on a family trip would be like letting a four-year-old play dress-up with real diamonds.

A canoe trip should be a priceless addition to the album of family memories. Our kids began canoeing before they were born. My wife was bow-paddling when she was seven months pregnant. Her doctor scratched his head and said, "Well, I guess it's all right as long as you don't turn over."

We didn't and I still remember the golden October with the river lit by the fire of fall change. Perhaps the unborn child does, too—he, like his brothers and sisters, is drawn back to the rivers of childhood, to the place where the waters sing.

Memories of the river: Marty and I celebrating a wedding anniversary on a sweet little river with no other people to interrupt the tranquility... the family camping in the mouth of a huge cave, celebrating someone's birthday... kids playing with Barbie dolls in the middle of the canoe... one of the boys chasing the family dog down a long gravel bar, shouting and laughing... the chill stillness of the river at dawn, with tendrils of fog swirling upward like ghosts... the fussy chatter of a king-fisher as it announces whose river it really is.

All these and a thousand more are my memories of the river, any river. Each river has its individuality, but each also shares a common history.

Each day ends on a gravel bar somewhere, beyond reality, beyond time. The night air is chilly and stars glitter over the dark humps of the hills. A barred owl gargles just downstream and the river sucks rhythmically at a bobbing snag. Chorus frogs sing their anthem in a nearby slough.

The canoes are drawn up on the bar and turned over so they'll be dry in the morning. A shroud of fog already lies over the river. The campfire coals have ebbed to a dull orange. The sleeping bag is warm and the pad under it reasonably soft. It has been a long day on the river. A long day....

And then the night is quiet, save for the eternal murmur of the flowing water. ☐

***Countless innovations*** *have revolutionized boat design in the many years since canoes were first built of birch bark by American Indians. Yet the canoe is more popular than ever, and modern craft employ high-tech materials and designs to fit every need. On club float trips, newcomers to the sport can profit from the experience of older hands.*

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*Joel Vance is the author of two humor collections,* Grandma and the Buck Deer *($17) and* Confessions of an Outdoor Maladroit *($22) available postpaid and autographed from Cedar Glade Press, Box 164, Jefferson City, MO 65102.*

# *Sweet* Daddy-Longlegs

Even people fearful of all "bugs" seem to like the long-legged and harmless harvestmen.

written and photographed by Harry Ellis ©1992

Every time naturalists take a really close look into the life of some wild creature, they are almost certain to discover that it, like hundreds of others, reveals its share of strangeness, mystery and adaptations for survival. They will become aware that there are myriad forms of life quite capable of awakening in all of us a genuine sense of awe and astonishment. This is especially true of some of the earth's lesser creatures as, for example, the common daddy-longlegs or harvestman.

Belonging to the order Phalangida, some 3,500 species of harvestmen are known worldwide and over 200 in North America. Though they belong to the same class as spiders, the Arachnida, and bear certain superficial resemblances to them—especially the long-legged kinds—they differ from them in several important ways. Few stranger creatures can be found, and one of their most startling peculiarities is in the arrangement of the eyes. The two dark, well-developed eyes are located in the center of the thorax, atop an occular turret or low lookout tower, with one eye facing to the right, the other to the left. Spiders normally have eight eyes located in groups on the front of the head. Like spiders, harvestmen have eight legs, but their head and body are fused into a single structure instead of a separate cephalothorax and abdomen as in spiders. Another difference is that harvestmen, having no silk glands, do not spin webs or make retreats.

Harvestmen, or daddy-longlegs, reach the peak of their abundance around the harvest season, just about the time that the first tints of autumn color begin to appear along the fencerows and pumpkins are ripening in the fields. This fact has inspired one of their common names. Suddenly we see them almost everywhere, in fields and gardens, clamoring over low vegetation, and on the sides of buildings. Being largely nocturnal, they lie low during the hours of brightest sunlight, tending to remain on the shaded side of a tree or perhaps under a leaf, but are abroad and active on cloudy days and after sunset. The massive cliffs and boulders, so common in our Western North Carolina mountains, are among their favored foraging grounds, where they run across the rocky surfaces with great speed and agility. Our most abundant species in North Carolina is the common brown harvestman *Phalangium opilio*.

As almost everyone knows, harvestmen have tremendously long stilt-like legs attached to small globular bodies. In proportion to body size, they have the longest legs of any living creature. All of them are used for walking, but the second and longest pair are also used in the same way that insects use their antennae, as "feelers" for sampling and exploring the environment. In addition, the

***Wherever aphids abound,*** *harvestmen gather at night to feed on them, as shown here on a milkweed plant. The unusual length of the spider's legs has bestowed upon it another name, "daddy-longlegs." The second pair of legs is also used as antennae, for feeling the environment nearby.*

***These red mites*** *aren't parasites, but merely hitchhikers taking a ride with the harvestman. The spider's two large, well-developed eyes distinguish it from other spiders that normally have eight eyes in groups on the front of the head.*

harvestman's long legs are quite often used in defense. When in the act of being captured by a predator, the limbs can be cast off at certain points of weakness, leaving the enemy holding a leg that is wriggling and twitching like a living thing; meanwhile the owner escapes with its life. In most cases there is no serious inconvenience at losing a leg or two, but sometimes we see harvestmen hobbling around on no more than three legs. Lost legs cannot be regenerated as is the case with spiders, and it is rare to find old specimens with the full complement of eight legs. A similar defensive stratagem is seen in certain lizards, which shed their tails when in danger of capture.

Harvestmen have no venom glands, and are entirely harmless. In spite of their resemblance to spiders, they do not generate the same degree of fear in humans as do these near relatives. People who are thrown into a state of panic by the very sight of a spider, have no apprehension at permitting daddy-longlegs to climb over their naked arms or legs. Because harvestmen consume several kinds of destructive aphids, they are considered beneficial to farmers and gardeners. You will find congregations of daddy-longlegs wherever aphids abound, especially at night. They also feed on other tiny insects and spiders, and may act as scavengers on soft, decaying, organic matter. They do not inject poison into their prey as spiders do but depend on their beak-like jaws for holding and crushing their tiny victims. In Europe there is a persistent superstition that the abundance of these creatures in late summer and fall foretells good harvests, and to kill them is to court disaster.

Because few scientists have made extensive studies into their lives, much remains to be learned about daddy-longlegs. Among professionals there is an inclination to pursue the exotic and the rare at the expense of the abundant and the familiar. What most people do not realize is that the rare is of minor biological importance compared with the common. The very abundance of any living thing—its amazing ability to endure and flourish against all odds—is the most significant fact about it.

Harvestmen belong to a group that arose far back in geological history. They were neighbors to the cave men and are little changed today. In coloration, most species are drab and inconspicuous, but some are marked with dark gray or black diamond-shaped patterns and are quite striking in appearance. Because identification can be made only on the basis of features not easily viewed by a field observer, we must leave this almost wholly in the hands of experts. As these creatures are among the lowest on the scale of intelligence, all their actions are guided by instinct. It is in these misty realms of low intelligence that instinct guides and commands with a great unconscious wisdom. The animal does not need to *think* how to act; it "*knows*."

In the Northern United States and in our North Carolina mountains, few harvestmen survive the winter. Here, only one species *Leiobunum formosum*, is known to hibernate. Most daddy-longlegs die in the same year that they are born. In the deeper South, many adults overwinter under piles of trash and in old rotting logs, expecially when the soft wood is laced with the tunnels of various insects. Some of these harvestmen are believed to live for as long as six years. In the Southwest, many hibernate in caves, where, with their legs interlaced, they congregate in immense numbers on the cave walls. In spring they emerge and spread through the surrounding countryside.

In his book, *The Night Country*, anthropologist Loren Eiseley relates an interesting experience. Searching for early human fossils in the Southwestern United States, he entered a narrow cave through an entrance so small that he was forced to crawl on hands and knees. When the passage eventually widened into a little chamber that marked the end of the cave, he set his light down and began to dig on the soft floor of the cave. But glancing up, he sensed that the dark, velvety-looking ceiling was moving. Holding the light closer against the roof, he knew that he was looking at millions of daddy-longlegs, layer upon layer of them. In the beam of his light,

***Stalked by a praying mantis,*** *the harvestman can only rely on its native speed and agility to escape. A daddy-longlegs may cast off one of its legs as a diversion if it is about to be captured by a predator.*

some of them awakened and began to fall from the roof. In the eerie surroundings, he wondered if the whole wavering ceiling might suddenly descend upon him, and, gripped by a cold, primal fear, he dropped his shovel and fled.

In addition to casting off their legs as a first line of defense, harvestmen have a pair of scent glands, located on each side of the carapace, that undoubtedly offer some protection against enemies. However, they are still preyed upon by birds, large spiders, centipedes and predatory insects like the praying mantis. But probably more of them die in the webs of spiders than in any other way, for when a daddy-longlegs becomes entangled in an array of sticky threads, nothing can save it. On almost every trip afield, I see numbers of them ensnarled in these webs.

I often see harvestmen with tiny red mites adhering to them. These are not parasites in the true sense, for they do no harm to the host or depend upon it for their life processes. But, taking advantage of its greater mobility, they use it as a means of hitching long-distance rides. Zoologists call this phenomenon *phoresy*.

For all living creatures, no matter how low on the scale of life, the great purpose that motivates is the mating and begetting of their kind. Each is driven by an absolute and compelling obsession to achieve the purpose of its existence. Mating in late summer and autumn, female harvestmen deposit their eggs, using their extensible ovipositors to thrust them deep into crevices in the soil. In some species males are very rare, and reproduction is largely by an astonishing process known as *parthenogenesis*, wherein the young hatch from unfertilized eggs without the aid of a male. In fact, in a few species, the males seem to be vanishing, and may disappear entirely, leaving the whole process of reproduction to the females of the species.

For over half a year, the eggs will lie dormant in the soil, while winter winds howl overhead. But as the days lengthen toward spring and the sun shines warmly upon the earth again, subtle forces are generated within the bodies of living creatures. Then, down in the damp earth, life begins to stir, for spring's magic touch is felt in dark and secret places. The eggs hatch and the young harvestmen penetrate to the surface and into the light. For daddy-longlegs, as for billions of other living things, the Great Awakening has come. ☒

*Source Never Found*

# Mysterious Oil Spill Kills Seabirds Off Coast

*Written and Edited by Vic Venters*

On March 24 this spring, it appeared the worst had happened—an oil spill off the fragile Outer Banks—when oil-covered loons began washing up on southern Virginia beaches. Soon after, N.C. Wildlife Resources Commission enforcement officers on the northeastern North Carolina coast began receiving reports of oil-covered loons washing up from Nags Head north to the Virginia line. In the next two weeks, 46 oil-covered loons and one oiled northern gannet were recovered. Two weeks after this incident, oiled loons began washing up on beaches along Brunswick County. A total of 22 oiled loons were recovered from the southeastern coast.

The U.S. Coast Guard was notified and initiated a coordinated search—involving the Wildlife Commission, the U.S. Fish and Wildlife Service and local private and volunteer organizations—to locate the spill.

During a 2½-week period, Wildlife Commission enforcement officers spent 130 hours searching for the spill. However, no spill was ever found and the source remains a mystery. No oil was ever found on North Carolina or Virginia beaches, nor did numerous flights ever locate a spill at sea. Theories as to the source of the oil range from a sunken World War II ship beginning to leak to ships flushing out their holding tanks.

The type of oil recovered from the birds appears to be a heavy grade of crude that was likely floating beneath the surface. Thus, diving birds such as loons would have been affected when feeding on fish. No one knows how many other birds or organisms died and were never recovered.

A similar unexplained event involving oiled loons occurred on the coast of New York's Long Island about three weeks before the incident off the Carolina coast. The direction of prevailing winds and ocean currents during the period could make it feasible that both events are connected to the same oil source.

Sadly, of the 47 recovered oiled birds from the Outer Banks area, only seven were rehabilitated and released into the wild. The rest were either dead when found or subsequently died because of oil poisoning and fouling.

Their deaths are a reminder of the fragility of sea life and the associated Outer Banks marine ecosystem in the face of oil pollution.

JACK DERMID

***When seabirds like this*** *oil-soaked common loon began washing up on the North Carolina coast this spring, authorities feared an oil spill offshore. The spill was never located. Most of the oiled birds died.*

*Found in One Neighborhood*

## Rare Crayfish Rediscovered in Greensboro

Urban Greensboro would seem a most unlikely place to find rare wildlife.

But that's exactly what happened this spring when biologist Dick Thomas rediscovered the Greensboro burrowing crayfish, not seen anywhere in the world since it first was identified from a Greensboro yard in the 1950s.

The crayfish—barely more than two inches long and with orange "fingertips" on its pincers—has captured the interest of scientists who had speculated it might be extinct. It's also grabbed the attention of planners of a road and a reservoir, who are watching carefully to see if there's a chance the rare crayfish could stand in their way.

Scientists know little about the Greensboro burrowing crayfish, not even its geographic distribution and range. It is believed to be a primary burrower, meaning it lives in a groundwater-saturated burrow, seldom leaving its shelter.

"Your instincts tell you that it has to be more widespread than this," said Bill Adams, a U.S. Army Corps of Engineers biologist. "No animal lives in one backyard in Greensboro."

But until March, the crayfish had been spotted only in one yard on East Whittington Street, less than a mile from downtown Greensboro. Frank O. Perkins, then a University of Virginia student, found the crayfish there during a late 1950s visit with his parents.

Perkins took several of the crayfish back to the University of Virginia, where renowned crayfish expert Horton H. Hobbs Jr. identified the crayfish as a new species. Hobbs named the crayfish *Cambarus catagius* but is commonly called the Greensboro burrowing crayfish. The two men published a paper on the crayfish in 1967.

No one heard from the Greensboro burrowing crayfish again. Not, that is, until Thomas, director of High Point's Piedmont Environmental Center, read about it in a book on rare species and decided to see if the crayfish still existed.

And on March 18, Thomas and Rick Robbins, the center's ranger, found the crayfish again —this time in a yard several blocks away from the original location. Hobbs, now zoologist emeritus at the National Museum of Natural History, confirmed their find as *Cambarus catagius*.

Thomas has since spotted burrows in nearby yards and he plans a survey, to begin this summer, to determine the crayfish's distribution and range.

Meanwhile, the state's Scientific Council on Freshwater and Terrestrial Crustaceans, which Adams leads, will recommend this year that the Greensboro burrower and two other crayfish receive protection. The Greensboro crayfish already is listed as "significantly rare" by the state's Natural Heritage Program and is a candidate for federal protection.

Even if the crayfish wins state or federal listing, however, protecting the crayfish might be difficult if it doesn't range beyond East Whittington Street. If its habitat was threatened, the crayfish might have a tough time getting across streets to a new home in urban Greensboro. "A crayfish trying to get across country isn't going to have much of a chance," Adams said.

*—Alison Davis*

JOHN PAGE

***One of North Carolina's** rarest crustaceans was rediscovered this spring when researchers found the small crayfish in a neighborhood near downtown Greensboro.*

## Safety Tournament Draws 55 Schools

Fifty-five schools and 547 students participated in the N.C. Wildlife Resources Commission's 14th annual Hunter Education Tournament this spring.

In the senior category, the three top teams were West Davidson High School in Lexington (2,921 points); Currituck High School in Barco (2,582 points) and Forbush High School in East Bend (2,826 points).

In the junior category, the three top teams were Forbush Elementary in East Bend (2,717 points); Fall Creek Elementary in East Bend (2,582 points); and Perquimans Middle School in Winfall (2,562 points).

These six teams were scheduled to represent North Carolina at the National Rifle Association Youth Hunter Education Challenge tournament to be held in New Mexico in July.

*For Hunter Safety*

## Commission Awarded

This spring, the N.C. Wildlife Resources Commission was notified that it was one of the state programs selected to receive the Top Ten Award in Hunter Education from the National Rifle Association.

The NRA's Hunter Education Awards Program recognizes state and provincial agencies that make significant contributions toward hunter safety within a particular year. "This award is due in large part to the dedication and hard work of our volunteer hunter safety instructors," said Captain Wilton Pate, the hunter safety program coordinator for the Wildlife Commission's Enforcement Division. "They made it possible and we're proud of them."

*TVA Improves River*

## Weir to Help Hiwassee Trout Fishing

JIM DEAN

***Wild trout and trout fishermen** should have better water conditions in the Hiwassee River once a weir, currently under construction, is completed this year. The rock and timber weir is expected to improve minimum flow levels, water temperatures and oxygen levels in this tailwater river.*

Trout anglers in western North Carolina may have better fishing to look forward to if an improvement to the Hiwassee River turns out as expected. This spring, the Tennessee Valley Authority (TVA) began constructing a weir on the Hiwassee River in Clay County below Chatuge Lake.

The Hiwassee River below Chatuge Lake is a tailwater fishery, and the river has a good population of wild trout. The weir is expected to improve river conditions for fish at least five miles downstream of Chatuge Dam.

The weir, which is basically a large treated timber crib filled with rock, will allow a minimum flow of water to be maintained in the Hiwassee River during periods when TVA is not generating electricity. The weir is also expected to improve dissolved oxygen levels and maintain temperatures in the river during hot summer months. Typically, tailwater rivers—which flow with water pumped from reservoirs—have more nutrients and, consequently, support larger-sized trout than small freestone mountain streams.

Construction of the weir is expected to cost about $1 million and is part of TVA's system-wide river improvement program designed to improve fisheries and wildlife habitat. The weir is expected to be finished later this year.

As part of the river-improvement plan, TVA also purchased a nine-acre tract of land adjacent to the Hiwassee just downstream of the weir and plans to construct a canoe- and small-boat access area.

*Book Review:*

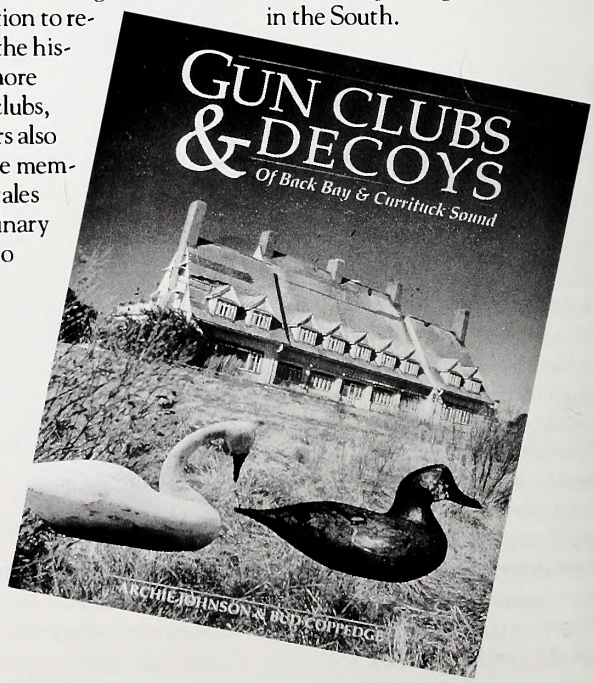
## Carolina Decoys, Duck Hunting Recalled

*Gun Clubs & Decoys of Back Bay & Currituck Sound, by Archie Johnson and Bud Coppedge. Published by CurBac Press, P.O. Box 1086, Virginia Beach, Va., 23451. Hardcover, maps, black/white and color photos, 223 pages, 1991. $40.*

This book details the rich histories of the numerous duck-hunting clubs and decoy makers from the famous Currituck Sound and Back Bay area of northeastern North Carolina and southeastern Virginia. At the turn of the 19th century, the area was known as the "Waterfowl Capital of the World" as rich Northern sportsmen flocked to its productive coastal marshes to form exclusive clubs for gunning the then-abundant wintering waterfowl populations.

The book is a tribute to the impressive research skills by Coppedge and Johnson. During the more than 10 years it took to research and gather materials for the book, the pair uncovered a treasure trove of old photos that capture the spirit of old-time coastal waterfowling.

In addition to recounting the histories of more than 100 clubs, the authors also present the memories and tales of the ordinary people who served at the clubs: the boatwrights, club managers, cooks and guides. An in-depth pictoral survey of Currituck Sound and Back Bay decoys is also presented along with biographies of major carvers from both areas. A location map of the clubs is also included.




While some clubs have fallen victim to time, money problems and declining duck populations, other survive and still provide critical habitat protection for wintering waterfowl in a region that is experiencing rapid development pressures.

Sadly, the book is also testament to a waterfowl bounty the continent will never again produce, given the continuing ravages of wetlands destruction over the past century. It's also true that by today's standards this "golden age" of waterfowling was a time of almost unregulated harvest, a legacy we are still paying for today.

*Gun Clubs & Decoys of Back Bay & Currituck Sound* is highly recommended for any waterfowl hunter or those interested in historical sporting traditions in the South.

## Wildlife Endowment Fund Report

**May 1992**

Principal Balance
$16,846,094.29

Interest Earned
$9,540,172.94

Total Receipts
$26,386,267.23

Interest Used
$3,282,016.48

Fund Balance
$23,104,250.75

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

*For the Record*

## Catalpa Worm Update

Dear Editors:

I enjoyed "To Bait Or Not To Bait" in the May 1992 issue. Your research on catalpa worms was as good as I've seen except for two glaring errors. If there is a way to turn a catalpa worm inside out on a hook after pinching off its head, describe the technique. Ain't no way, hoss. Actually the very difficult method of turning a catalpa worm inside out on a hook is accomplished by piercing the head with the point of the hook—but not past the barb—and gently rolling the head back through the body. Don't plan on fishing fast.

The second error is that an inside-outside catalpa worm on a hook does resemble "an oblong gob of goo," but it's not white. It's green. As for collecting wasp larvae, a blast from a garden hose always worked for me. Wet wasps can't fly. Otherwise, great article that brought back fine memories.

—*George Freeman*
*Charlotte*

*Thanks for the update, George. You're right on both counts. It's been a while since I turned a catalpa worm inside out, and I had forgotten the business of using the head as a sort of ram. And yes, they are green inside, but I recall them bleaching out to near-white after being used awhile. As I remember, once you get a worm reversed, it can make a pretty tough bait that can catch quite a few fish before you need a new one. Thanks for getting me straight on the facts.*

—*Jim Dean*

## Catch Rates Hold Steady

Was bass fishing better in North Carolina's public rivers and reservoirs 10 years ago than it is today? Maybe. Then again, maybe not. According to data submitted by bass tournament anglers in the state, catch rates for legal size fish—14-inches or better—have remained roughly the same over the last decade.

In 1991, results were submitted from 136 tournaments measuring over 27,500 hours of fishing. These anglers weighed in a total of 5,415 legal-sized bass, and released approximately 95 percent of them alive. By these figures, it took the average tournament angler five hours of fishing to land one legal size bass in 1991. Catch rates were somewhat better on coastal rivers than in reservoirs, with .27 fish being landed per hour in rivers, while .16 fish were taken per hour from reservoirs.

In 1982 and 1983, the average tournament angler took .12 fish per hour in reservoirs and .14 fish per hour from coastal rivers—actually a somewhat inferior rate compared to 1991.

"We all tend to remember the good trips from the past and forget the bad," said Scott Van Horn, the Wildlife Commission's Piedmont reservoir program coordinator. "The effects of tournament angling have been of concern to some. This study indicates angling has held up, at least in the past decade."

## Name Misspelled

Due to a typesetting error by our printer, Donny Taylor's name was misspelled in a photo cutline on page 22 in the article "Echoes on Old Battlefields" in the July 1992 issue of *Wildlife in North Carolina*. We apologize for that error.

## Conservation Booklets Available

Anglers, hunters and other recreationists concerned about clean water and wetland habitat can learn more about protecting these vital resources by obtaining the Izaak Walton League of America's new brochure, "A Citizen's Guide to the Clean Water Act" and "Saving Wetlands: Why Should I Care?"

A limited number of copies are free to individuals and groups. Orders of 100 copies or more are $5 per 100. Send requests and a SASE for single copies to the Izaak Walton League of America, 1401 Wilson Blvd., Level B, Arlington, Va., 22201.

## DeLorme Atlas Map for Sale

Hikers, hunters, fishermen and all outdoor enthusiasts will find few maps more useful than the recently released *North Carolina Atlas & Gazetteer*, published by DeLorme Mapping of Maine.

This atlas features 76 pages of full-color maps based on a scale of 1 inch to 2.4 miles and the maps cover all road names and contours, as well as the Appalachian Trail, lakes, streams and boat ramps.

The atlas is set up on an easily understood geographic grid system, and a gazetteer section lists activities and points of interest in the following categories: bike routes, campgrounds, ferries, freshwater fishing, hiking, historic sites, hunting areas, lighthouses, pier fishing, recreation areas, trout waters, unique natural features and other points of interest. The atlas is available for $14.95 plus $3.75 shipping. For more information, write DeLorme Mapping, P.O. Box 298-6903, Freeport, Maine 04032, or call 1-800-227-1656.

# Fish Stories

*by Vic Venters*

Recycling isn't just for garbage. From trout to bass, more and more anglers are adopting catch-and-release as a way to enjoy a fish more than once. Not only are populations and catch rates kept high for many anglers, you're doing yourself another favor. No one has to clean the fish.

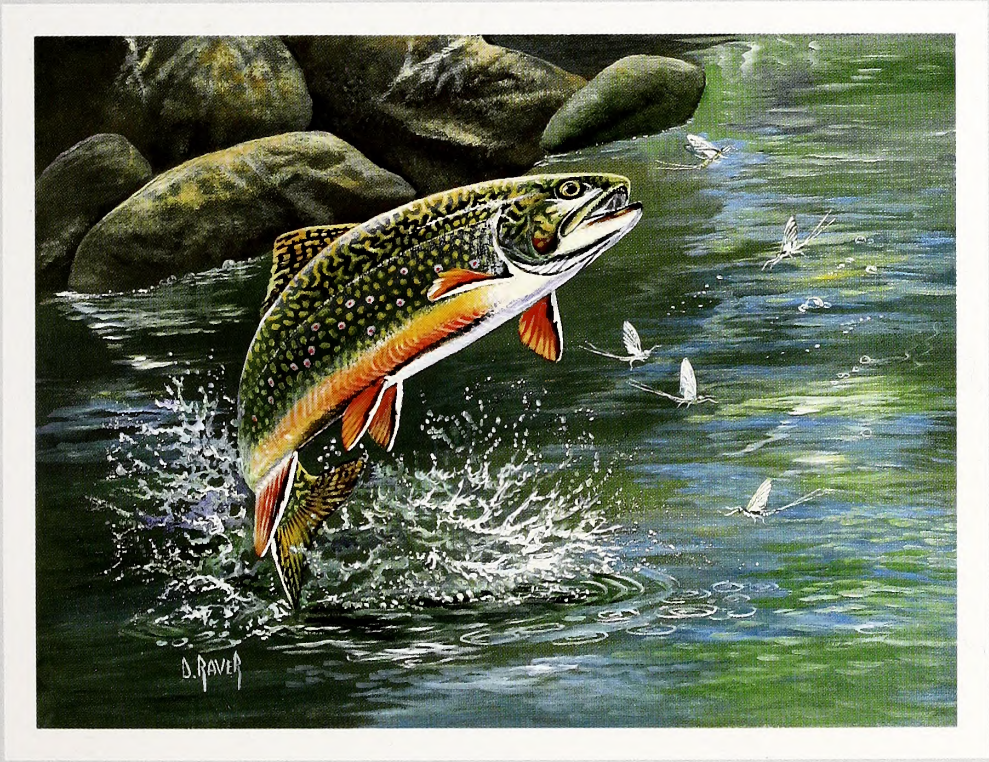
*Catch-and-Release Care:* Turning a fish loose doesn't work if it dies shortly after you've returned it to the water. Like people, fish are more susceptible to heat-induced stress and temperature shock in summer months. If possible, avoid handling the fish and return it to the water as quickly as possible. A pair of long-nosed surgical forceps is an excellent hook remover and minimizes handling. Never toss fish back, especially larger specimens. Instead, gently lower them into the water. If you place a fish in the livewell and plan to release it later, keep the water well-oxygenated.

Just as important is the water temperature. Keep your livewell cool. In summer months, many fish in reservoirs will be taken from deeper water that can be 10 to 15 degrees cooler than surface water temperatures. A rapid change from 75 degree water to 90 degree water can shock the fish and be fatal. Keep the water in the livewell fresh by pumping water in. You can also add ice to the livewell to chill the water, but you must be sure to bring enough ice to maintain relatively constant temperatures. Rapidly fluctuating temperatures can be just as harmful as hot water.

Speaking of recycling, an alternative to ice is to freeze water-filled 16-ounce plastic soda bottles. Bring a dozen or so in your cooler and add to the livewell on a regular basis. You can use them over and over, but be sure they are clean of any soap or cleaning chemicals before adding to the water.

*Grow Your Own:* If you've got a compost pile in the back yard, adding earthworms will help speed the decomposition process and it will also assure you a steady supply of fish bait through the summer. Collect your own worms under moist leaf litter or buy a container or two from the bait store. Although food supplies should be ample, you might want to add a few handfuls of cornmeal to your compost.

# Limited Edition Prints of the 1991-92 Sportsman's Stamp License are Now Available.




"Brook Trout"
painting by Duane Raver

The 1992 North Carolina sportsman's stamp print selection, a brook trout feeding on mayflies, was painted by Duane Raver. To order your 1992 North Carolina sportsman's stamp or print, contact your art dealer. Your purchase of a sportsman's stamp or print will support North Carolina's wildlife conservation programs.

## Canvas Geese

Beginning about the turn of the century, canvas-covered decoys became increasingly popular in Currituck Sound, but were also made for use in Carteret and Hyde counties and in Virginia's Back Bay. Nick Sapone maintains the tradition with these handsome modern examples.

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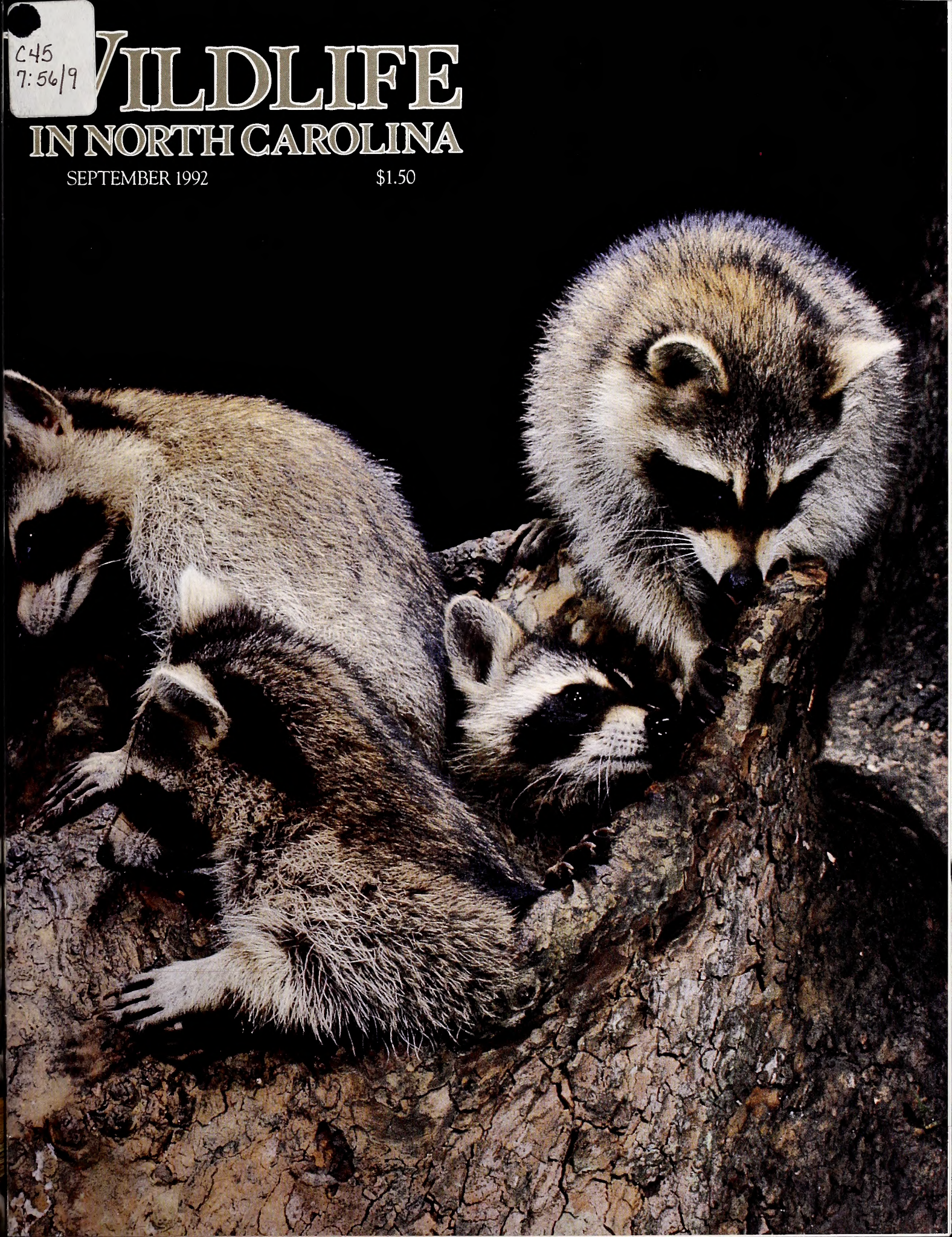
# WILDLIFE IN NORTH CAROLINA

SEPTEMBER 1992 $1.50



# Homegrown Interludes

*by Jim Dean*

Three pounds for a dollar. That was a deal for real tomatoes nurtured by late afternoon storms and a blazing Carteret sun. I picked only those that were ripe since they had zero chance of surviving the weekend.

It was still early, but it was clearly going to be another scorcher and the roadside grove was an oasis of live oaks that seemed to attract and hold remnants of last night's ocean breeze. Just beyond the dense shade, the fields shimmered in brilliant stillness like an overexposed photograph. Insects hummed in the high grass, the hot buzz of summer.

It was pleasant there, and I was reluctant to leave the still life of squash, peppers, melons, boiled peanuts and sweet corn. Besides, something here had tunneled into pockets of long-forgotten memory, unlocking images that had not surfaced in years. How long? Thirty years? Forty? Perhaps it was the smell of vegetables that had triggered the recollection of grandmothers and aunts in sweaty cotton dresses and grimy aprons shelling butterbeans on porches and airy dogtrots. My thumbnails grew sore thinking about it. Whatever it was, I lingered and began to look around.

I inspected a jar of molasses, but it wasn't local. Probably it was as good as any, but the label was too fancy, the address too distant. The black syrup I remembered was kept in a big tin lardstand in the pantry and, because sugar was rationed during the war, my grandmother used it as a substitute. Some of it sweetened coffee and tea, but most met its destiny on the quintessential scratch biscuit, having begun its journey from a field in Northampton County. Early each fall, we rode the mule-pulled wagon piled high with cane, sucking on the stalks until we reached the mill where that mule or another one walked in circles hitched to the end of a long shaft. The raw juice from the crushed cane was boiled into syrup, and every fly from Potecasi to Aulander joined us in sweet celebration.

Label notwithstanding, I bought a jar. At the end of the vegetable bins, I spotted a cooler of shrimp. I would need some bait, and unlike the shrimp I see all too often, these were fresh and firm, a translucent green with no odor. It doesn't seem to be widely appreciated that sea mullet, spots and pompano want their shrimp absolutely fresh. It's odd considering that fastidious humans often settle for mushy shrimp, spoiling to smelly pinkness.

A plan was gaining purchase. I would fish the piers and surf, cook my catch and read myself into guiltless, mid-morning, post-lunch and pre-bedtime naps. I would eat tomato sandwiches on white bread, slathered with Miracle Whip and dusted thickly with black pepper, or marinate the slices in sugar and vinegar as my grandmother had done so long ago. Maybe I would eat a tomato whole like an apple in honor of my grandfather. On a morning like this, he would have been in the garden at dawn, carrying a large basket, but his labor was not without pleasure, and he would graze with a puckish grin, handing me a tomato straight off the vine, cool and dewlapped. We would stand there eating, passing a saltshaker he carried back and forth. It was a ceremony all the more strange considering that I would not, at that tender age, have eaten a tomato without first picking out all the seeds. But no more, and surely when this weekend was done, my face would be as pimply from the acid as a 17-year-old's.

One detail awaited. Invitations to the meals would have to be extended. And, more important, the fish would have to accept them. Late that afternoon, I tried the surf for awhile unsuccessfully, then fished on the end of the pier until well past sunset. For my trouble, I had but two small Spanish mackerel. That would never be enough, unless...well, why not? I would eat the leftover bait. After all, the shrimp had been kept on ice, and *Bait du Jour* had a rather elegant ring to it.

While the small mackerel filets were broiling in the oven, I peeled the remaining shrimp and seared them quickly on top of the stove in garlic and olive oil. The tomatoes had been in the sugar and vinegar for several hours, and the jar of molasses and a loaf of bread were waiting.

An hour later, stuffed and drowsy, I walked out onto the beach and sat in the dark facing the breakers. It had been a wonderful day, and yet, I had picked my memories too selectively and surely honored them too selfishly. How foreign my day would have seemed to those kinfolk who, even in their leisure, had seldom napped or read or fished; whose laborious summer days had begun before dawn and ended at dark with peas yet to can and corn still to shuck.

Indeed, only one pleasurable link was not in doubt, and I went back to the cottage to check it.

Yes, there were enough tomatoes for tomorrow.

September, 1992
Volume 56, Number 9

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Cover** *Young raccoons emerge from a den ready for a night of foraging. Photograph by Steve Maslowski.*

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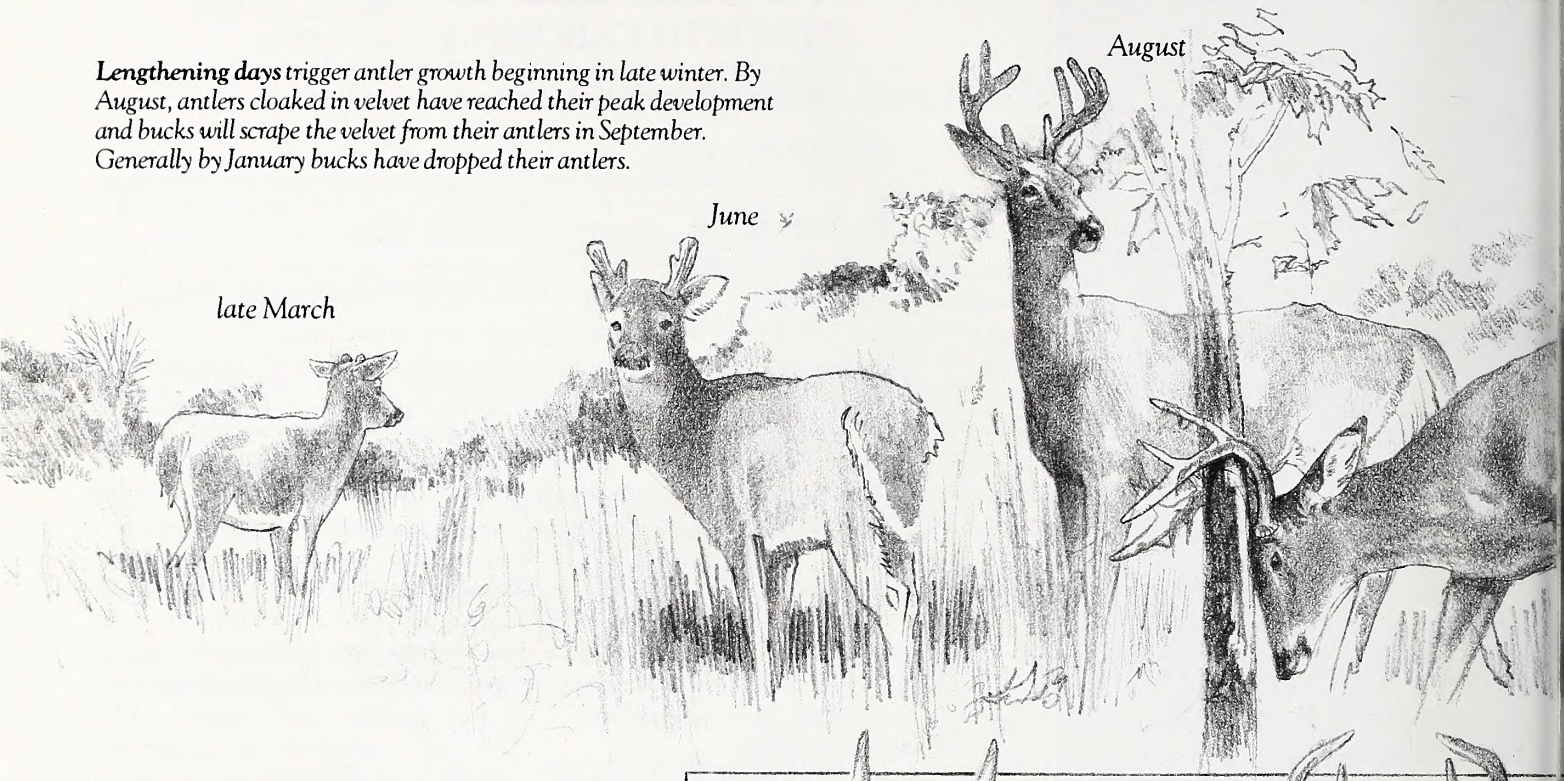
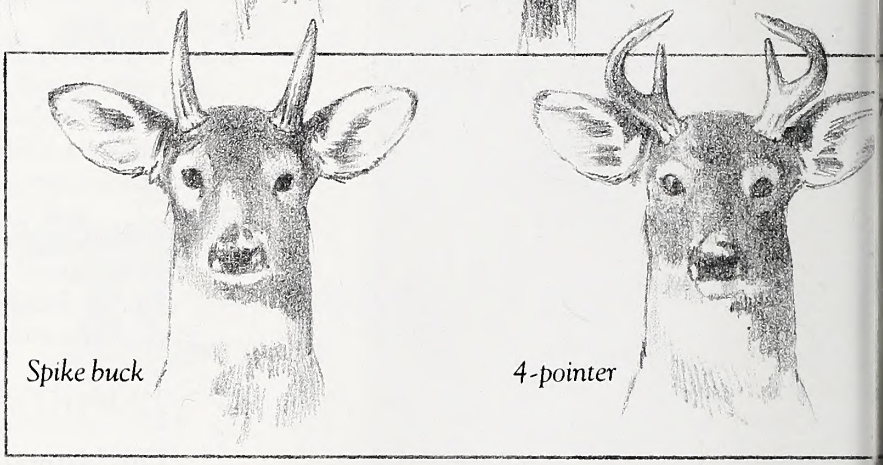



***Lengthening days*** *trigger antler growth beginning in late winter. By August, antlers cloaked in velvet have reached their peak development and bucks will scrape the velvet from their antlers in September. Generally by January bucks have dropped their antlers.*




***It's difficult to judge*** *the age of a buck by its antlers. Though the antlers on these three bucks have various shapes, each of the bucks is 2½ years old. Antler development depends not only on the age of the buck, but on the nutritional value of the food it eats and its genetic constitution.*

# An Appreciation of Antlers

*written by Lawrence S. Earley/*
*illustrated by David Williams*

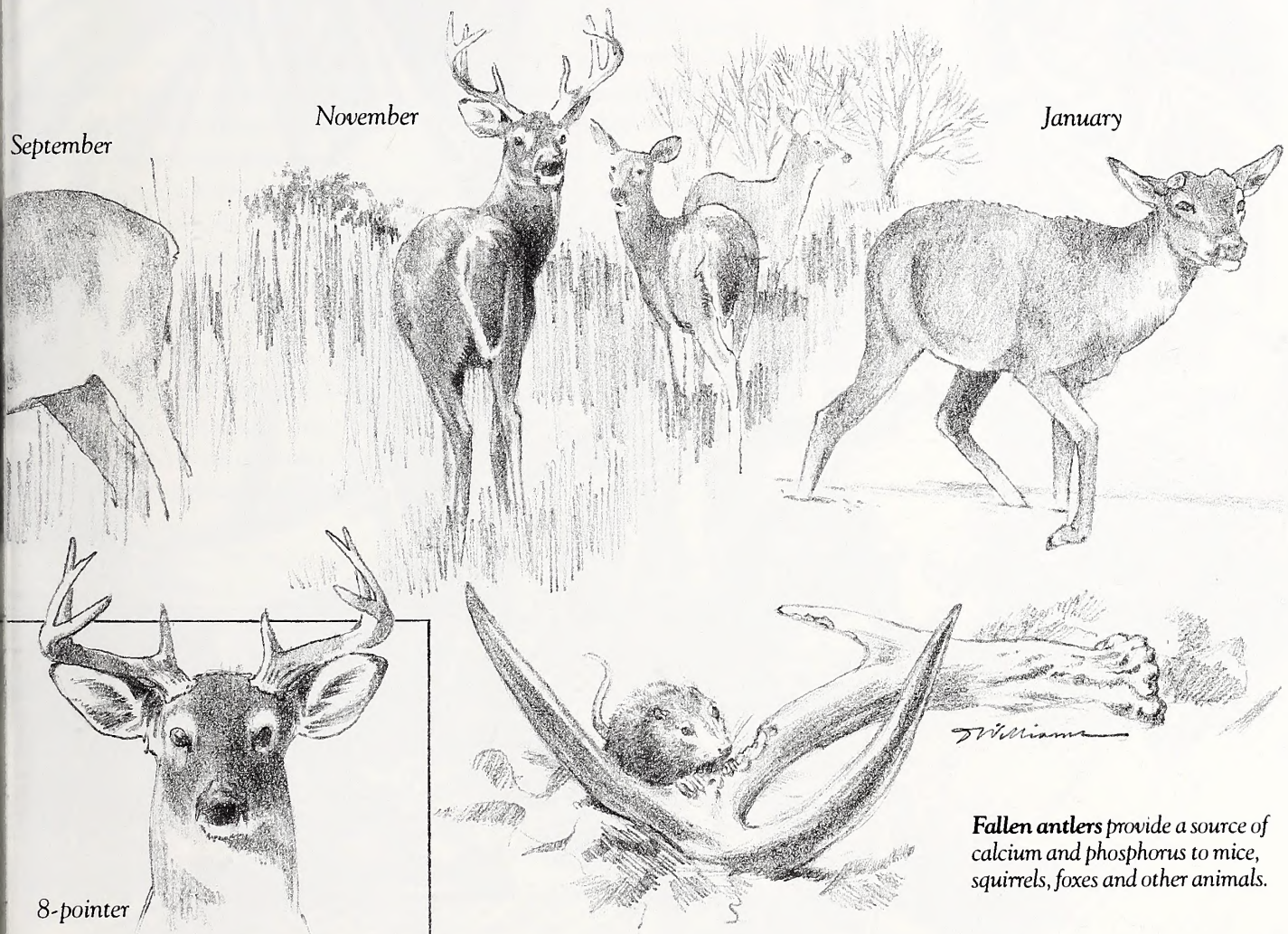
Antlers are at once commonplace and extraordinary. Commonplace because deer are among the most widespread wildlife species in North America, their antlers as familiar to most people as their morning breakfast cereal. (In some areas, elk, moose and caribou—the other North American mammals with antlers—are just as common.)

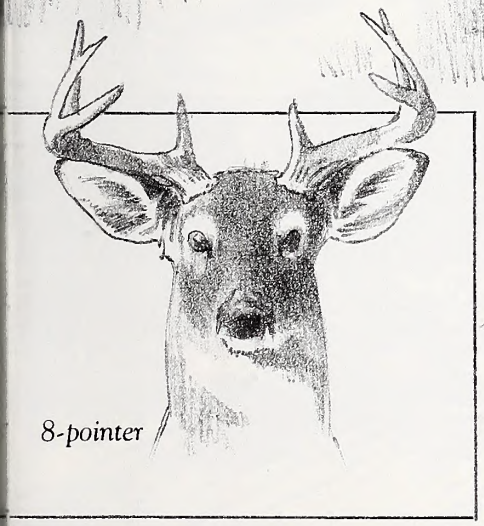
Why extraordinary? Well, think of it this way: what other bones on any other animal are grown each year (at a considerable expense of energy, mind you), discarded at the end of the year and then regrown the following year?

Indeed, antlers are bones—solid bones, without marrow. They're not horns. Both horns and antlers are bony projections on the skull, but horns are generally more permanent structures, carried in North America by cows, sheep, goats, antelope and buffalo. Antlers, however, are seasonal, grown and cast off every year.

Like other bones, antlers are nourished by blood. Three sets of arteries flow in and over them. One, on the inside of the antlers, carries blood to the interior to fuel the growth of the bone. A second set grows on the outside of the antler; these hardened arteries can be seen as a series of bony ridges that are most prominent at the base of the antlers. Blood also courses through veins in the so-called velvet, the soft "skin" that covers the antlers during its growing stages.

Antlers generally begin growing in early spring, triggered by lengthening days. Testosterone, the male sex hormone, also plays a role in developing antlers. Indeed, antlers are chiefly associated with males, although female caribou grow them






***Fallen antlers*** *provide a source of calcium and phosphorus to mice, squirrels, foxes and other animals.*

habitually and antlered female whitetail deer are not unknown. So powerful is this hormonal stimulus, that a castrated buck will drop its antlers in a few days while a female injected with testosterone will begin growing them.

By the end of August the antlers are fully developed and stop growing. At this point deer begin to strip off the velvet by rubbing their antlers against bushes and trees. In a few weeks, the buck will clean its antlers of the velvet and work them to a fine ivory finish. Technically, the antlers are dead now and at some time after the rut (mating season) ends, usually in late winter, the antlers fall off.

All that vigorous antler rubbing in the fall may have an additional purpose. Two specialized glands located in the buck's forehead area emit secretions that it rubs onto trees and brush. By scraping its antlers afterwards over the bushes or saplings, the buck may be loading them with pheromones that communicate with both does and other bucks.

If it takes such energy to grow a big set of antlers (about as much as it takes a female to carry a fawn), what role do they play? It's been a difficult subject to answer conclusively. Are they weapons? Most wildlife biologists don't think so. The wide branching of antlers makes it difficult for bucks generally to injure each other during the shoving matches that occur during rut when rival bucks vie for does. And when both males and females really want to fight—to protect themselves from a predator, for example—they tend to slash at their attacker with their hooves.

Wildlife biologists believe that antlers serve as visual displays, as important to the herd as to the individual deer. The size and even shape of a buck's antlers may indicate to other bucks its strength and physical conditioning, information that will help them decide whether to challenge him for the does in the area. If the antlers tell a potential challenger that he's overmatched, he'll try his luck elsewhere. Antlers help keep order in the world of deer, another reason why they are so extraordinary.

# ROCK & RYE

Me and the Kid had a score to settle. But it would have to wait.
I had to go see a man about a dog.

written by Mike Gaddis ©1992
illustrated by Jim Brown ©1992

Dust clouds lingered along the now empty street and the sun was a molten ogre in a brassy sky. There was cotton in my mouth and care in my step as I walked slowly toward the livery stable at the edge of town. Somewhere behind me a horse nickered and, in the distance, a dog barked. I was a man adrift in a dangerous land, shortly to face death eye-to-eye with no one to back me. I carried a Winchester '73, and two short guns, one rigged for a Colorado cross-draw, the other under my waistband. Beads of sweat trickled from my forehead and tumbled down my face, leaving drunken tracks in the trail grime. I glanced ahead to the alley between the watering hole and the dry-goods emporium. The time was at hand.

The Durago Kid had stepped to the boardwalk from the alley, his back to the storefront. Like a wraith, he moved to a post under the porch, took a last drag on his cigarette, and stepped down into the dust. He was tall, lean and coarse, and the scar that was his trademark lay in proud flesh across his cheek. He was reputed to have gunned down 16 men by way of Texas, Arizona and New Mexico. He had been making bones about number 17 . . . my bones! We were 30 feet apart now. At this range, someone would die! His right hand hung over the Colt in a tied-down holster.

"You've lived too long, Pike," he growled.

"If you think you can waltz," I spat back, "just start the music!"

He grinned menacingly and the fingers on his gun hand quivered.

Then Mama called!

I tried to ignore her, but it was no use. So, that's the way it was. I had to back away from my set-to with the Kid, with him standing there leering at me like I was a piece of dirt under his boot.

It must be a basic law of nature. Mamas always call at the wrong time. You can prospect around for hours undisturbed, but get in a good gunfight, corner the cat, or draw a bead on the mockingbird, and it happens.

I ran to the house, agitated.

"Yeah. What do you want?" I snapped.

"Don't take that tone with me, young man!"

"Yes, ma'am."

"Your Uncle Sidney is on the phone and wants to talk to you."

Impromptu calls from my Uncle came rarely and were usually special. The Kid could wait.

"Hello," I answered.

"Boy," my Uncle Sid said, "you might ought to come over. We've got something to show you."

I didn't even ask. Whatever it was, I needed to see it. I shucked my guns in the middle of the floor and hit the screen door running, leaving it to slam hard against the frame. Mama yelled something at me, but it was lost in the wind. I ran down the hill and across the bridge where the trolls lived, and sprinted into the midst of the pines where the small frame house rested. The door was ajar and I hollered. From somewhere beyond the door, my Aunt Louise beckoned me in.

They were on the living room floor, these two grown-up people that, fortunately for me, had never quite grown up. Between them were two Black-and-Tan hound pups, and maybe it was only June, but my eyes lit up like Christmas candles. The pups lifted their heads momentarily to question my presence, then the male returned to worrying my uncle's boot straps, and the little female sank her teeth back into my aunt's dress hem.

"They're beautiful," I said wistfully. "Who's are they?"

I dropped to my knees and both pups came with a rush.

"Well," my Uncle teased, through a grin, "we thought maybe, if you approved, we

might call them ours."

I shot a big smile back at him. "Then call 'em ours," I said.

The male pup had a broad head and muzzle, with good, wide paws under him, and great, pendulous ears. He would make a big, strong dog. His chest would be deep and his wind would be long, and he would have a deep rolling bawl that would reverberate off the hills and echo through the hollows. But, for now, he was busy washing my face. The female was more petite, with bottomless, hazel eyes and clean features. She would be lithe and lean, with staying quality. She was sitting there, looking at me with those eyes, stealing my heart.

"Course, you'll have to help take care of 'em, and help train 'em," Uncle Sid continued. "With a little luck, we might make a pair of decent coon and possum dogs out of 'em. Come October, we'll find out."

We named them Rock and Rye.

I rounded the corner of the house in an extended gallop, a green coon hide kicking up dust behind me, and ran full-throttle into a gaggle of chickens. In a wild scramble and tumultuous din of squawks and cackles, a riot of ponderously flapping poultry beat it for the safety of the mulberry tree and the smokehouse roof. All save one fussy, old, red hen. She dawdled around just long enough for me to arrive, gathered up her petticoats, and clamored right in under my feet. We piled up in a cloud of dust and feathers, and the last thing I saw before I hit the ground was a monstrous load of fresh chicken manure, all heaped up and twirled around at the top like soft-serve ice cream. When I got up, I had a big gooey mess on the front of my shirt and my knee was bleeding! I would have wrung the old biddy's neck, but I couldn't stop long enough.

"Here, Jughead!" my Uncle Sid had said, with a twinkle in his eye. He called me that sometimes after the cartoon character in Snuffy Smith. He had Rock and Rye on a double-snap leash. He had teased them with the coon hide, and they were going crazy.

"Tie this rope to your belt. Drag that hide around the house and down the branch a ways. Leave it up a tree where the dogs can't reach it. Hurry back now, but don't come the same way."

So, I left the red hen for another time and ran on down the branch. I found a small poplar with a bare trunk and limbs starting about 8 feet up. I dragged the hide to the base of the tree and rubbed it on the trunk as far as I could reach. Then I shinnied up, pulled the rope over the lowest limb, and tied it off. The coon hide dangled enticingly. All set, I raced back.

My Uncle took an appraising look at me when I came up and kind of smiled. The chickens were still raising Cain in the back yard. The pups were six months old now and three-quarters grown. They had reached a frenzy and were lunging hard against the leash!

"All right, dogs," my Uncle Sid said, rubbing each in turn. He unsnapped the leash. "Get 'em."

Both dogs tore out for the corner of the house, us in behind. Uncle Sid let out a loud squall! "WHOOOAAGGH! Get 'em, dogs!"

The dogs were giving tongue as they rounded the house. Then, suddenly, they went quiet. When we got there, they had their noses to the ground. They had reached the point of the chicken collision and were trying to untangle the scent trail. After a minute, Rock picked the scent up and announced it to the world in a long, throaty bawl. Rye bayed tentatively a time or two, then fell in with her mate in a series of high-pitched yelps. You would have thought somebody was wailing the lights out of her! Away they flew, down the branch.

Uncle Sid and I looked at each other and grinned. "Whoooaaggh!" I yelled. And we took out running.

When we got to the poplar, Rock was fussing about on my return trail, confused with the loss of ground scent. But little Rye was trying to climb the tree! She had found the dangling hide and meant to have it. The poplar was almost vertical, but she'd get a running start and try to run up the trunk. Her snapping jaws were missing their mark by mere inches. When she fell back, she fell hard. But she was right back up, barking every breath in a steady chop.

Uncle Sid called Rock in and grabbed Rye by the collar, while I climbed the tree. Then he turned the dogs loose again.

"Shake that hide and blow that squaller," he ordered.

Rock saw the hide jump and went beserk. Rye was standing on the tree, whining and growling.

"Throw it down," said my Uncle.

It never hit the ground. The dogs growled fiercely as it fell and lunged for it, grabbing it in mid-air. Uncle Sid let them fight and worry it for a few minutes and then took it away and put it in a sack, out of sight. We made much of both pups, praising them in encouraging words.

"They're comin' on," Uncle Sid proclaimed. "We'll borrow that pet coon of Sheriff Mason's a time or two and repeat this with him, 'cept we won't kick him out. Then we'll take 'em to the woods."

September was near, and school, and I was dreading that. But you can endure most anything as long as you've got a little something to look forward to. Close behind September would be October, and then November, the best month of the year. It would bring clear, crisp nights, and the Harvest Moon, and the coons would walk. And we'd be there, Uncle Sid and me, with ol' Rock and little Rye. I was shivering, and it wasn't cold at all.

The autumn moon was on the make and it bathed the woods in a sort of eerie, perpetual twilight. There was a chill in the night, and you could see your breath on the air. The sky was as clear as a wishing well, and the stars sparkled across its immensity like a thousand diamonds thrown by wistful sweethearts.

We stood on Buzzard Rock on Taylor's Creek, Uncle Sid and me, listening. Deep down the Wooliever Hollow, a hound dog was bawling, in long, sorrowful notes that lingered mournfully in the night like lost souls begging salvation.

"We'd better get in after them," Uncle Sid said, "Rye's already out of hearing."

Off the rock and down the hollow we ran, through the clawing cat brier and alder thickets. I fell off a log into the branch and skinned my chin. Later, I caught a rebounding limb across the face. It left a big, ugly welt that looked mean in the lantern light. But I was so excited, I hardly noticed. After a while, we left the branch run and climbed to the top of the hill that stood east of the sprawling, cornfield bottom. Pausing, we caught our breath, and listened again.

The coon had turned up the bottom and the dogs were hot in after him. The tempo of their music was quicker now, and steady. They were telling the news and moving on fast.

Taking out after them again, Uncle Sid fell into a stump hole up to his knee and hit the ground with a grunt. But he was back on his feet and running before I could ask if he was all right. Ahead, we could hear the all-out urgency of the dogs. They were in full cry, giving Br'er Coon what for. Rye was wailing like a tormented banshee!

"WHOOOAGGHEE! Talk to me, dogs!" my Uncle hollered.

He turned to me. "It won't be long now," he shouted, "they've got his address."

About that time the dogs barked tree, and the hair stood up on the back of my

neck! "Yaaooahh!" I hollered, and left out. The dogs sounded about two hundred yards up the bottom and I was dodging stumps, ducking limbs, and bouncing off trees in a mad rush to get there. Behind me, I could hear limbs rattling and sticks breaking, and I knew my uncle was trying to keep up. The dogs were barking incessantly, in staccato chops.

The dogs had set down on a massive gum tree behind Clement Luck's pond. They said he was here, and no gripes about it. It was hard to understand how they could chop the way they were and still breathe. I felt like barking, too, and probably would have, but along then Uncle Sid burst onto the scene.

He said something about the biggest gum tree in Randolph County, but I couldn't get it all over the racket the dogs were making. Better a gum than an oak with a bunch of leaves on it, I was thinking. I knew about those big oaks. They kept most of their leaves 'til December and were usually full of hollows.

The lantern lit up a little arena around the great trunk of the gum. In its faint illumination, the dogs looked demonic, jumping and snapping out of the night. Above the small circle of light, it was pitch black. Uncle Sid unlimbered the long, 7-cell flashlight from its shoulder sling. He pointed it up the gum tree and pushed the switch. The brilliant beam lanced the darkness, and the lower limbs of the giant gum stood starkly white in the reflected light. Bright as it was, it faded considerably in the upper reaches of the tree. Uncle Sid backed away and began slowly circling. We were straining to see shining eyes. The dogs were choppin' high cotton.

In the very top of the tree, barely visible in the failing beam of the flashlight, there was a dark lump on the trunk that might be a coon. But if it was, he wasn't in any hurry to look down.

"Cut loose with that squaller a time or two," Uncle Sid said. I hit it a time or two. Whatever was up there didn't move. We eased around the tree a bit more.

"Hit it again, like you mean it," Uncle Sid yelled. he hollered at the dogs to keep them high. He didn't need to. I laid down hard on the squaller that time, and it sounded like the meanest varmint in three counties. On its dying note, two burning eyes lit up the lump in the top of the gum.

"WHHOOOAAAGGHH!" my uncle squalled. "There he is, boy!" I was feeding cartridges into the tube of the little Remington Sportsmaster, and I was so excited I dropped half of them on the ground.

"Take a rest on a limb, now, and take your time," Uncle Sid admonished.

I moved around until I had a shot at the lump in the tree and propped the barrel over a dogwood branch. I was trying to get the sights lined up, but I was shaking and they kept dancing around as if they had a mind of their own. I tried to squeeze off a shot, but I knew it was wild when I pulled the trigger. The sound of the gun sent the dogs into a renewed fury. I missed twice more.

Uncle Sid smiled, with a half laugh. "Settle down, boy. These dogs are dependin' on you."

Mustering my resolve, I took a deep breath, let out half, and settled back under the gun. I waited until the sights quit jumping and squeezed the trigger. The crack of the rifle was instantly followed by a hollow thud. For a minute, it seemed I had missed again. Then the lump in the tree unfolded into a coon and bailed out, catching limbs momentarily on the way down, and falling among the frenzied dogs. There was a frightening minute of fierce fighting. Rock yelped and jumped back. His ear was torn and his muzzle was bloody. He shook his head, snarling and biting at the air, and jumped back into the fray. Rye had a death grip and was shaking the coon furiously. Then both dogs clamped down for keeps and the coon was quickly finished. We pulled them off. The fight was draining out of them, but they were still whining anxiously.

Uncle Sid picked the coon up by a hind leg, and held it aloft for inspection. It was a big

boar, maybe 15 or 16 pounds. He handed him to me. I admired him for a while and then dropped him in the sack my uncle held open. The hide would fetch a half-dollar or so, and I would be back in ammunition for the .22, which was always my primary concern.

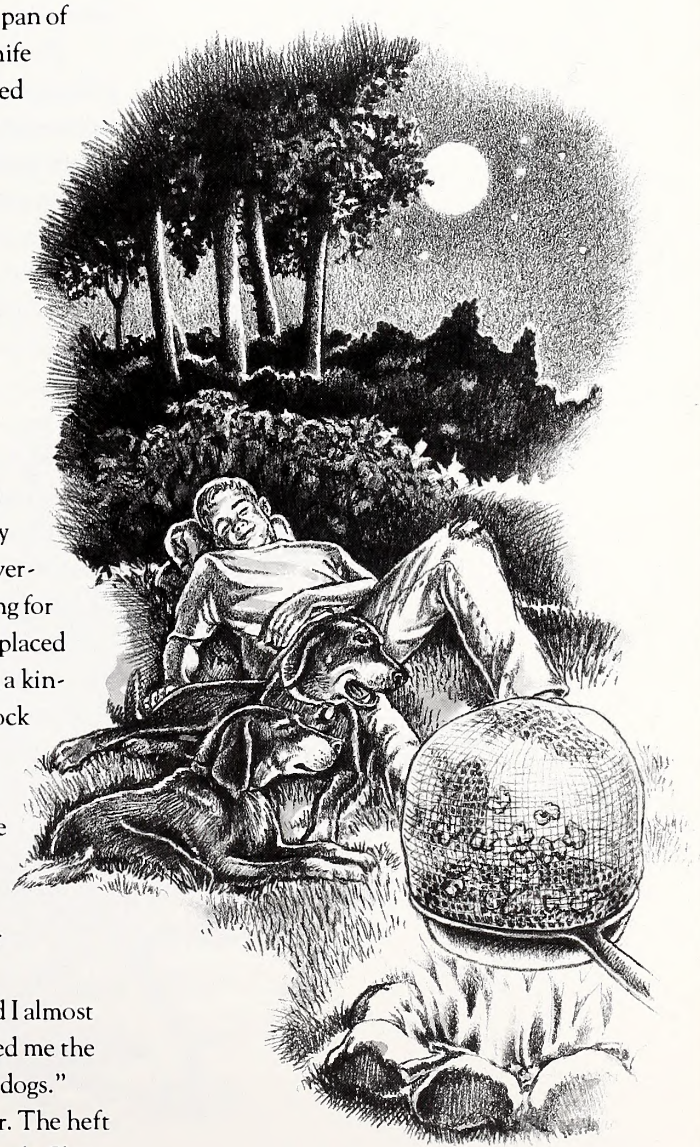
Uncle Sid slung the sack over his shoulder and we cast the dogs off anew. We treed two more coons before midnight, took one, and left the other in the tree. Along about one o'clock in the new morning, we passed a muscadine vine and stopped to rest. Uncle Sid showed me how to dig around under the leaves and find a few lingering grapes, somehow overlooked in their time by the forest creatures and now all shriveled and mellowed by the recent frost. Insulated under the damp leaf cover, they were deliciously cool and burst all sugary sweet in my mouth.

The dogs struck again shortly afterward, and ran strong for an hour, but then trailed off and never treed. Uncle Sid took the hunting horn from his belt and blew them in.

"It's been a good night," he remarked, "no use overdoin' it." Another time I might have argued, but I was tired and getting sleepy.

Our hunting round had taken us to the Hale Place bottoms and not far away was a mossy knob overhanging a quiet, secluded pool on the creek. We made our way there and Uncle Sid raked back the leaves and built a small fire, while the dogs and I sank exhausted onto the leaf-mottled carpet of moss. He pulled a wrinkled, little brown sack from the pocket of his jacket and poured out a handful of popcorn. He dropped it into the pan of an old, blackened wire popper, along with some butter he had scraped with his knife from a wadded up piece of wax paper. From another little roll of paper, he sprinkled in a measure of salt. Then he settled back on his elbow, and held the pan of the popper over the fire, moving it back and forth now and then to keep the corn from sticking. My eyes were heavy and the rhythm of his motion in the fireglow lulled me into a trance.

After a few minutes, there was a half-hearted sputter from the pan of the popper, and a few seconds later, a muffled thump. Then another, heavier thump, and another. Soon the thumping had increased, rising in cadence until the popping of the individual kernels became indistinguishable. The fluffy, white popcorn swelled against the screen lid. Its aroma was sweet and enticing. Uncle Sid opened the lid and sat the popper between us. The first mouthful was so good it made my mouth hurt. We ate slowly, savoring it kernel by kernel, talking of the night's events and studying the pulsating coals of the dying fire. Below, the silvery reflection of the moon rested on its back on the placid surface of the pool, and overhead the constellations were boldly drawn against the sky. I lay on my back looking for Orion—the mythical hunter, whom Diana had loved but accidentally killed and placed in the heavens forever. My aunt had told me the story, and it was one I liked. I felt a kinship, for I was a hunter, too. Rye lay close beside me, her muzzle on my leg, and Rock lay close by her, his big head in the hollow of her flank. My uncle was a comforting presence a few feet away. I felt good all over. Then I drifted off to sleep.



We woke near dawn and in the gathering of day, walked at leisure toward the Coble House, our point of departure the night before. The dogs were in front, content to stay close and travel at a comfortable pace. Uncle Sid followed, the sack with the two coons slung loosely over his shoulder, and I brought up the rear with the rifle resting muzzle down over my forearm.

As we neared the house, my uncle hesitated in mid-stride for a moment, and I almost ran into him. He turned and looked at me. Then he smiled knowingly, and handed me the sack from his shoulder. "Here, Jughead, you carry this and walk in front with the dogs."

I shifted the rifle to my left hand and heaved the sack over my right shoulder. The heft of the coons felt good on my back. I saw my Aunt Louise standing on the front porch. She would see the sack and ask for the story. I could feel the pride swelling.

She was waiting with a cup in each hand, the steam from the freshly brewed coffee lifting gently into the chilly morning air.

We still went occasionally, but it was not the same. In the song of the November nights, the high notes were missing. We had lost little Rye to distemper the year before, and were reminded each time of the lingering sadness. Rock felt it, too. He often lay listlessly in his kennel, a look of loneliness in his eyes. Sometimes, I would hear him from my bed deep in the night, baying slowly and mournfully for hours. His spirits would rebound when we took him to the woods, and the long strains of his soulful bawl would roll down the sprawling bottoms much as before. But it was difficult to rekindle the intensity of the hunt, for now it seemed more like a eulogy.

The world pushed me on. I survived Mrs. Lancaster's 10th grade Latin class, and Ruby McCallister's advanced algebra exam, and left for college. That first autumn was hard. When it wore into November, I would often sit at my desk in the dorm in the small hours of the morning, sick with thoughts of home, longing for the things I had left behind. For a while, I would succeed in transcending the present, and my spirit would wander back to the Uwharrie woods to join others that must be waiting there.

Gradually, the loneliness was forced aside as I fell into the rigors of an education. By my junior year, other corridors of life had opened to me, and I was plunging ahead with concern for little other than the present and the future. The geography might have been the same, but the distance to home had grown considerably. So, what happened that February night, I was not expecting. I had studied at the campus library until midnight, and was late returning to the dorm. It was a dreary evening. Fog loitered along the streets and sidewalks, and gathered around the street lamps in faint halos. An icy drizzle was steadily falling, and the wet barren limbs of the oaks and elms glistened coldly in the refracted light. I opened the door and stepped inside the warm dormitory.

As an afterthought, I decided to check the mail before I retired. Stuffed into my narrow postal box was a lumpy, manila envelope, soiled and worn from its journey. On its face in fading handscript, it bore my name. My eyes jumped to the return address. It read Sidney Walker. It was from my uncle. It had been several months since I had seen him. It hit me that this was the first written message I had ever received from him. Premonition tightened my throat as I opened the envelope. Inside were two leather dog collars, one well field-worn, the other blackened and smooth with age. There was a slip of paper, torn from a yellow, ruled pad. On it were scribbled a few lines. I got no further than the salutation.

It read, "Dear Jughead,"

It had been a long time, and the emotions came cascading back like water down a dry branch after a spring thaw. I left the dorm and went back out into the rain and the cold. It was where I belonged. I crossed to the city park and sat under an oak tree. Big, cold drops of rain dropped spasmodically from its limbs, on my shoulders and down my neck. It didn't matter... it really didn't matter at all. After a few minutes had passed, I pulled the dampened slip of paper from the sodden envelope once more.

"Dear Jughead,

Old Rock died yesterday. We buried him under the moss by the spring run, alongside Rye. Your Aunt Louise etched an inscription for them both on a scrap of copper. It should weather nicely. You'll have to see it when you come.

I thought you might want their collars to keep as you grow older.

Love,
Your Uncle Sid"

I was rummaging around among some old record albums recently and found a long-playing 33 cut by a singer named Paul Ott some years back for the National Wildlife Federation. One of the songs on the label was Ol' Blue, a venerable country ballad about a coonhound. I wiped the dust off the record, put it on the turntable and sang along.

*I had an ol' dog, and his name was Blue,*
*Bet-cha five dollars he's a good 'un too.*

I had forgotten how good Ott's version is, and I was enjoying it again, immensely.

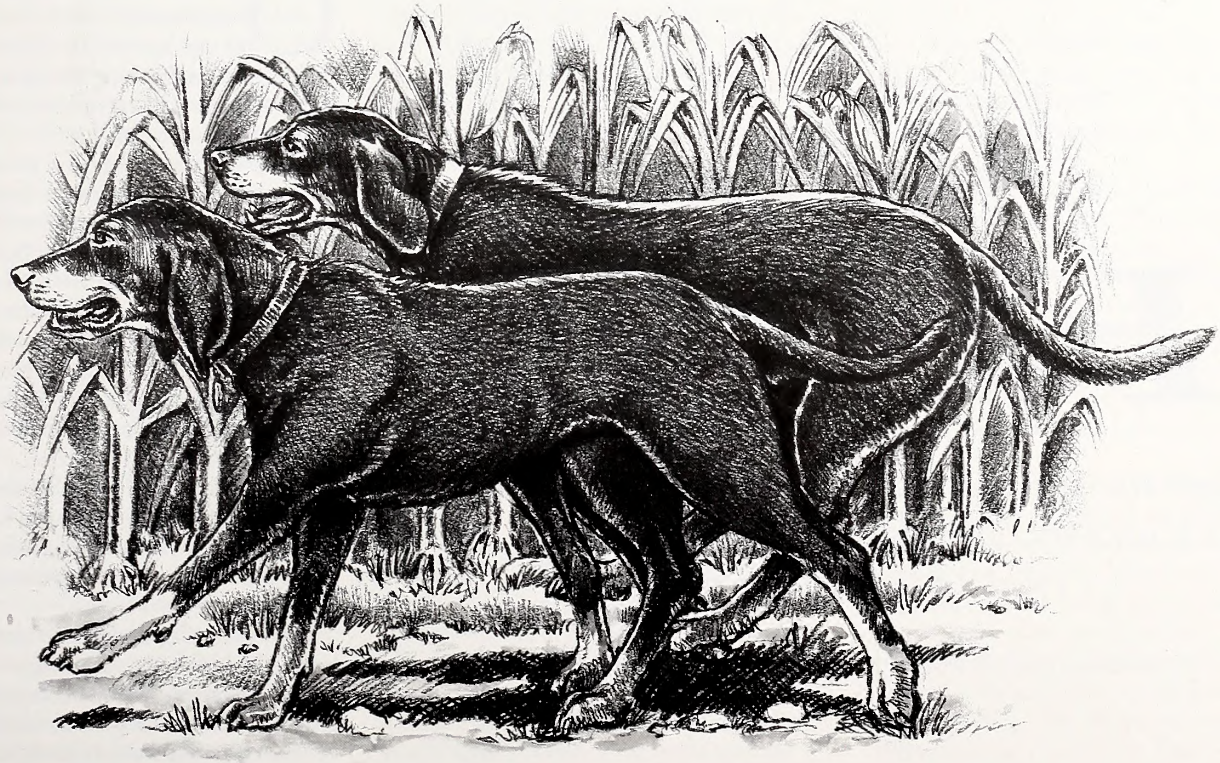
*Many and a-many of an early morn,*
*I've heard Ol' Blue a-runnin' thru the corn.*
*Good Ol' Blue, you're a good dog, you!*

In the background, there's a coon hound a bawlin', and some banjo and guitar accompaniment. But it's that lonesome coonhound, bawlin' his very soul right out on the ground, that makes the song.

*Ol' Blue he died, and he died so hard,*
*He shook the ground in my back yard.*
*An' I dug his grave with a silver spade,*
*An' I laid him down with a silver chain.*
*Dear Ol' Blue, you're a good dog, you . . .*
*I'm a comin' there too, I'm a comin' there too.*

I never hear that tune that I'm not reminded of Rock and Rye. You could substitute either for Ol' Blue, and it might not rhyme, but the song would still work. I was 12 years old that night we stopped on the knob over the creek at the Hale Place and popped corn, and slept in the leaves with the dogs until dawn . . . and my Uncle Sid was almost 50. The years have slipped by, and now I'm 50. I have a young nephew of my own.

Wonder what a couple of hound pups go for now-a-days? ☐



# Making FIRE

When native Americans needed a fire, they twirled a stick until friction generated a spark. I can do that, I said. Little did I know....

written and photographed by Burt Kornegay © 1992

*October 28*: Becky says she has a recurring dream in which I'm wandering in rags around the countryside, bow drill in hand and tufts of thistledown clinging to my eyebrows, and people are saying, "He had a family once, you know."

I recorded the above entry in my journal during my struggle last year to learn the primitive art of fire by friction. My wife's dream did not prove to be prophetic, but back in October neither of us could be sure.

I had become interested in fire by friction partly because of my work as a wilderness guide. For years I had been running expeditions of backpacking and canoeing in the Southern Appalachians, and I prided myself on my ability to build campfires. I knew what sources of tinder and kindling were in the woods, where to find them, and how to train them to catch a flame and run with it, even when the woods were so wet the ground squished with every step.

But I wanted to know more than just how to build fires, an art though that may be; I wanted to know how to *make* fire. There is a difference. In building a fire, the initial spurt of flame is provided by a match, and the skill comes in knowing what to do with that flame once you have it. But to make fire is to start

***The author wields the bow,*** *twirling the spindle so that the friction creates a glowing coal in a notch on the fireboard. That seems simple enough, yet acquiring the subtle skills to make fire consistently with a bow drill can be a humbling experience.*

from scratch, to start with cold materials found at hand in the woods and, using a primitive apparatus called a bow drill, to generate flames from them. Making fire is an ancient art; it was practiced by the Cherokee in these mountains for thousands of years, and I wanted to learn it.

I began by reading books on fire by friction—three of them, in fact. "This book makes survival against odds in the wilderness sound so simple it nearly appears to be fun," proclaimed a blurb on the jacket of the first one, with its sure-fire chapter on making fire. The second book announced that fire by friction would be "a simple matter" *if* we correctly constructed the bow drill. And it gave exact directions for making the apparatus—directions that differed from those in the first book and, I saw as I continued reading, from those in the third book, too.

Consider what shape to carve the all-important "drill" or "spindle" (that rod-like part of the bow drill that spins on end against the "fireboard" and grinds off hot wood powder). Book A said the spindle should be 1 inch in diameter, 8 inches long, rounded on top and pointed on the bottom. Book B agreed with Book A on spindle diameter but advised that the spindle be 12 inches long, pointed on top and rounded on the bottom. Not so, according to Book C, which, diverging from the other two, said the spindle should be but ½-inch in diameter, 12- to 15-inches long, and rounded on both ends!

I was puzzling my way through these diverse instructions, when I heard about an "Earthskills Rendezvous" of wilderness survival experts that was soon to take place in the mountains. Fire by friction was to be one of the primitive arts taught at this gathering. Here was a chance for me to watch a firemaker demonstrate his craft and to forget about the books.

The fire-by-friction instructor was a stocky, bearded man named Slack. Dressed in buckskins, he sat in a meadow with an ax, a block of seasoned basswood, and a few other items before him. Slack started by showing us wanna-be firemakers gathered round how to make the tinder bundle, which receives the hot powder produced by the bow drill. Slack's tinder bundle looked like a bird's nest. He formed the nest out of finely shredded dry grass, then lined it with thistledown. The purpose of the down, Slack explained, was to cradle the coal of hot powder and spread its heat to the flammable grass.

After we had made tinder bundles, Slack taught us how to fashion the four parts of the bow drill: the fireboard, spindle, bow and handhold. First he split off from the basswood block shingles about ½-inch thick by 3-inches wide. These would be our fireboards, the part of the bow drill that lies on the ground and receives the whirling end of the spindle. Next he split off spindle-wood sticks for us. Mine measured ¾-inch thick by 8-inches long. Slack told us to whittle these sticks to the shape of dowels and—giving what was for me the fourth set of directions on the subject—to carve both ends to points. Then he passed out bows 2 feet long that he had cut from curved maple limbs. For convenience, Slack substituted nylon parachute cord for the traditional rawhide or sinew bowstring. He strung his bow loosely with the cord and told us to do the same.

The fourth part of the apparatus, the handholds, Slack brought ready-made. They were short lengths sawed from a walnut branch and split down the middle. The bark side was for the hand to grip while using the handhold to press down upon the spindle.

Once each of us had the four parts of the bow drill, we finished the apparatus by making "spindle sockets" in the fireboard and handhold. To start the handhold socket, Slack stuck the point of his sheath-knife into the bottom or flat side of the handhold and twisted it a few times to make a shallow hole. He started the fireboard socket the same way, placing his knife point about an inch in from the edge of the board. He would use the bow and spindle to finish hollowing out these sockets.

To put the bow and spindle together for use, Slack deftly twisted the spindle onto the bowstring, so that the string wrapped once around the spindle, and he hooked the spindle with his thumb to hold it in place.

Telling us to watch, Slack knelt on his right knee and planted his left foot on the fireboard. He stuck the bottom point of the spindle into the fireboard hole and capped the top point with the handhold, which he held in his left hand. Then, with his right, he began to push and pull on the bow, as if it were a saw, and this caused the spindle to twirl in the holes. As we watched, excited, the whirling points of the spindle began to smoke and grind into the fireboard and handhold, making blackened sockets.

Last, cutting in from the edge of the fireboard with his knife, Slack carved a small pie-shaped wedge or notch out of the fireboard socket. The hot powder from the socket would collect in this notch as the spindle whirled.

Following his painstaking manufacture of the bow drill, Slack started a fire with it surprisingly fast. He "greased" the top point of the spindle by rubbing it through his hair, so the point would spin smoothly in the handhold socket; placed a flat chip of wood under the fireboard notch, to catch the hot powder; got into position and started stroking the bow. He stroked slowly at first but, as the fireboard socket began to smoke, he increased his speed. Suddenly, I saw smoke billowing up out of the socket, Slack's bow arm pumping, and hot powder pouring into the notch. Giving a half-dozen finishing strokes, Slack lifted the bow. There on the wood chip lay a pile of smoking powder. Slack blew gently on the pile until a red coal began to glow.

***Ancient tools*** *of the fire-making trade (clockwise from top): bow, handhold, wood chip, spindle, tinder bundle and fireboard (center).*

Then, carefully picking up the chip, he slid its coal into the tinder nest, held up the nest by his fingertips and blew it into flame!

Slack turned to us and said, "Now it's your turn."

To this day I am not sure just how I made fire on my very first try. The handhold wobbled in my left hand, the bow lurched and bucked in my right. I felt so tippy in the kneeling position I thought I was going to fall on my side. I recall smoke spiraling up and stinging my eyes. Then there it was through the tears—a pile of smoldering powder. The group applauded when I blew my tinder into flame.

I had done it! How had I done it? Slack remarked that he too had made fire on his first try only to fail 34 times afterward before getting a second coal. To make sure my success was no fluke, I took up the bow drill and in two tries made two more fires.

The first thing I did on arriving home the next day was to get out my bow drill and start two fires while Becky and our two-year-old son, Henry, looked on. That was on October 21.

Late afternoon on October 22, Becky and

***Spinning bow drill** creates heat by friction.*

***Wood in notch smokes,** then forms glowing coal.*

***Fire maker** blows on glowing coal.*

***Red-hot coal** is placed in tinder bundle.*

Henry watching, I made a sixth fire—the final one with may basswood spindle, since I had worn the spindle down by then to a 4-inch stub. Confidently, I carved a new spindle and fireboard out of some western red cedar I had at the house, said to be good for fire-making. Then, for the seventh time I knelt, pumped on the bow, and saw the fireboard socket smoke. And for the seventh time I blew on the hot powder collected in the notch. But for the first time I saw the powder give one wispy puff and die. "Just a freak," I said, as Becky and Henry moved closer; hadn't I made six fires in a row? Again I made the spindle whirl and again hot powder piled up in the notch. And as I watched it go out again, I felt the first stirrings of the peculiar blend of unease, hope, confusion, determination and near-despair that I was to learn sooner or later comes to all would-be makers of fire. I was still trying to grind out a coal when night came on and Becky took Henry inside.

Selected journal entries from that day on tell the tale.

*October 23*: Alone at home: I tried for more than two hours to day to produce a coal, in vain.

*October 24*: Frustrated after an hour with the cedar, I went back to the basswood stub for reassurance but failed with it, too. So I carved a spindle out of yellow poplar, another recommended wood, and sawed away until the sweat dripping off my nose soaked the fireboard socket.

*October 25*: I cranked on the poplar spindle today until my arm was wobbly, then sat down, drank a beer, and tried to relax. At it again—inside this time beause it was raining—I churned out so much acrid smoke the fire alarm went off, scaring Henry and making Becky mad.

*October 26*: Made fire with poplar this afternoon on my second try, then failed on no fewer than two dozen subsequent attempts. Henry's learned a new sentence, "Try again, Daddy, try again!"

*October 31*: Have failed the last five days to make fire with poplar, with cedar, and with the basswood stub—now but 3 inches long. One of my survival books recounts an Indian myth about the bow drill in which the penetrating, aggressive spindle is male, the receptive, nurturing socket is female, and the ardent union of the two gives birth to a coal. I'm caught in a modern twist to the myth in which I'm a frustrated midwife to an inadequate 3-inch spindle and a dry socket.

*November 2*: Desperate enough to cheat, today I baked a spindle and fireboard in the oven, then drilled away with them, failed four times, re-carved the spindle, tried twice more, and after a furious effort, produced a small coal. In the process I bored through the fireboard into the living room rug, leaving a blackened hole.

*November 3*: Relegated to the basement now with my firemaking, I had my first cedar coal smoking tonight, only to see it go out, almost taking my life with it. Like "gold" in the hands of a fool, that gleaming coal lured me on to try again and again. On my last feverish attempt, I drilled through the hand-hold and into the palm of my hand. I knew it was getting hot down there. What discouragement to find it was my flesh on fire and not the powder.

*November 4*: Searching this evening through my survival books for some clue to my failure, I came upon the sentence, "An inexperienced person should start early to prepare a fire; then, if he is lucky, it may be burning brightly by the middle of the night." Clearly this was written by a man who did not want to discourage novices. He knew the truth.

*November 8*: After an exhausting number of attempts to make fire this evening, I got a small spark to hold, placed it in the tinder and blew it into flame! It wasn't just any old spark either, but my first with cedar. I gave a war whoop that brought Becky down with an ice pack, thinking I had scorched myself again.

*November 9*: Made fire on my second try with cedar today. What a thrill to blow on a smoldering pile of powder and to see a red eye open there and look back.

*November 10*: Failed today with poplar but produced a large cedar coal on my second try.

*November 11*: Made fire twice with cedar. Henry came down to "help" me, lying beside the hot powder and puffing away with unsure aim.

*November 12*: Made two more fires with cedar. Henry brought his teddy bear down to help blow.

*November 15*: Feeling sure of myself with cedar, today I turned to the problematic poplar once more. Went at it for an hour on the deck with a new poplar spindle; no luck. Norman came over to see what was up. I told him to watch, set myself to it with redoubled effort and failed four times. So I reached for the trusty cedar spindle, only to wear it out. Carved another and wore it out. Switched back to the poplar spindle and wore it out. It was dark by then, Becky was serving supper "with or without you," and Carol was calling Norman home.

*November 16*: Uncertain about everything again, I tried for two hours today to make fire with cedar and poplar, as well as spruce and willow. An absolute failure. After lunch I tried for another futile hour, this time using all the woods in various combinations. After supper I carved a new cedar spindle and tried twice to make fire—to my surprise, successfully both times. So I went over to Norman's

and made a fire for him. Becky says she can tell by how smoothly the spindle runs whether or not I'm going to be successful. And I notice the smoke becomes heavy looking and yellowish when I'm drilling out a coal. I realize now I have been trying too hard—applying too much pressure on the handhold and grinding out charcoal slivers rather than burning powder. The bow drill needs a lighter touch.

*December 1*: I've started fires the last two days with poplar, cedar, juniper, willow, spruce, and hemlock. The kneeling position has become second-nature, I've gained control over the bow, and I'm learning to coax coals out of many types of wood. It's a start.

The question arises, why go to all the trouble? Or as my Atlanta sister quipped after witnessing one of my early efforts, "You want fire?"—and she flicked a Bic. The survival books answer the question with a question: "What if you end up matchless in the wilderness?" I suppose this could happen, but I think there is slim chance of it, even to those who spend much time in the wilds. I have slogged through downpours, swamped in rapids with all my gear, and been lost twice on exploratory treks out west, but I have never lost, ruined, or come close to using up my matches.

No, my attraction to fire by friciton comes not from a concern about being matchless in the wilderness, but from my romantic notion of what a true woodsman ought to be and know. The Natty Bumpo in me yearns for the attainment of this wilderness art.

As I hunkered down to the bow drill day after day, however, I discovered other reasons to continue the endeavor. For one, I began to see nature with a rekindled eye and to learn through trial and error some of the help she offers the firemaker. I found that the yellowish down of virgin's bower, so plentiful in the Appalachians, makes a good substitute for thistledown. I found that pine sap will "grease" a handhold socket, allowing the spindle to whirl quickly. I found that the beautiful heartwood of the eastern juniper—a fine-grained, fragrant, purple wood—makes a long-lasting handhold, and that juniper bark, when rubbed vigorously between the palms, breaks down into flammable tinder. I had known the juniper in an abstract way—*Juniperious Virginia*, family *Cupressaceas*, etc. But now, awakened by my interest in the bow drill, I began to see the tree's particular properties, its usefulness and beauty.

I was longer in learning a more important reason for practicing fire by friction. During my early struggles with the bow drill, I felt frustrated by the uncertain results. Only gradually did I come to see a peculiarly modern arrogance fueling my vexation, namely, the assumption that I could do or become anything I wanted and that I ought to realize a quick success at it. The lowly bow drill humbled me. Here was a simple instrument any Cherokee child 300 years ago could have whirled into flame, but I could not.

***Once a glowing coal** has been transferred to a tinder bundle made of shredded dry grass and thistle down or similar material, the firemaker blows it into flame—sometimes.*

Moreover, I realized that in my efforts to become a firemaker I was skirting the coast of a world of aboriginal knowledge, was making first contact with a distant way of life, largely destroyed and lost now, perhaps, but which had existed on this continent for thousands of years. This unanticipated realization of the historical actuality of the American Indian startled me. It was like rounding a bend in the trail and catching sight of a bear moving off unhurriedly through the trees.

Thoreau describes a night he spent in the Maine woods when, camping with four Abenaki hunters, he lay in the dark listening to them talk among themselves, and suddenly...

> "This unaltered Indian language...took me by surprise, though I had found so many arrow-heads, and convinced me that the Indian was not the invention of historians and poets. It was a purely wild and primitive American sound..."

We can no longer hear the unaltered language of the Abenaki hunters, but the squeaks and hums of the primitive bow drill they used live on for anyone who cares to listen. ⊠

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*Burt Kornegay is a professional wilderness outfitter, guide and owner of Slickrock Expeditions in Cullowhee, N.C. He has published maps and written for various publications, and is co-author of* Mules and Memories: a Photodocumentary of the Tobacco Farmer.

# North Carolina Hunting Seasons 1992-93

| Species | Hunting Season | Daily Limit | Possession | Season |
|---|---|---|---|---|
| Crow | Thurs., Fri., Sat. of each week from July 1 to Feb. 27 and Thurs., Fri., Sat. of each week from June 1 to June 30 plus Labor Day and Christmas Day | | No restriction | |
| Dove | Sept. 5-Oct. 3 (all day except opening day which begins at noon)<br>Nov. 23-Nov. 28 (all day)<br>Dec. 12-Jan. 15 (all day)<br>Shooting hours are from one-half hour before sunrise until sunset. | 12 | 24 | None |
| Rails, Moorhens and Gallinules | | | | |
| Moorhens and Gallinules | Sept. 5-Nov. 13 | 15 | 30 | None |
| Clapper Rail, King Rail | Sept. 5-Nov. 13 | 15 | 30 | None |
| Sora Rail, Virginia Rail | Sept. 5-Nov. 13 | 25 | 25 | None |
| Deer | | | | |
| Bow and Arrow | Sept. 7-Oct. 3 (**Eastern)<br>Sept. 7-Oct. 3 and Oct. 12-Nov. 21 (**Western)<br>Sept. 7-Nov. 7 (**Central)<br>Sept. 7-Nov. 14 (Northwestern) | 2 | *5 | *5 |
| Muzzleloading | Oct. 5-Oct. 10 (**Eastern)<br>Oct. 5-Oct. 10 (Western)<br>Nov. 9-Nov. 14 (**Central)<br>Nov. 16-Nov. 21 (Northwestern) | | | |
| Gun | Oct. 12-Jan. 1 (**Eastern)<br>Nov. 16-Jan. 1 (**Central)<br>Nov. 23-Dec. 12 (**Northwestern)<br>Nov. 23-Dec. 12 (**Western) | | | |
| Gun Either Sex and Special Either Sex | See *1992-93 North Carolina Inland Fishing, Hunting and Trapping Regulations Digest* | | | |
| Black Bear | See Regulations Digest | 1 | 1 | 1 |

| | | | | |
|---|---|---|---|---|
| Wild Boar | Oct. 12-Nov. 21 and Dec. 14-Jan. 1 | 1 | 1 | 2 |
| Gray Squirrel | Oct. 12-Jan. 30 | ***8 | 16 | 75 |
| Fox Squirrel | Oct. 12-Dec. 31 (Only in 18 counties. Season closed elsewhere. See *Regulations Digest*) | ***1 | 2 | 10 |
| Common Snipe | Nov. 13-Feb. 27 | 8 | 16 | None |
| Quail | Nov. 21-Feb. 27 | 10 | 20 | None |
| Ruffed Grouse | Oct. 12-Feb. 27 | 3 | 6 | 30 |
| Raccoon and Opossum | ****Oct. 12 (sunrise)-Jan. 30<br>****Oct. 19 (sunrise)-Feb. 27 | No restriction on opossum. See *Regulations Digest* for bag limits on raccoon. | | |
| Rabbit | Nov. 21-Feb. 27 | 5 | 10 | 75 |
| Rabbit—Box Trapping | Nov. 21-Feb. 27 | | | |
| Pheasant—Nonnative Male Pheasant Only | Nov. 21-Feb. 1 | 3 | 6 | 30 |
| Woodcock | Dec. 10-Jan. 23 | 3 | 6 | None |
| Bobcat | ****Dec. 14-Jan. 30<br>****Dec. 14-Feb. 13 | No restriction | | |
| Fox | See *Regulations Digest* | | | |
| Groundhog | No closed season or bag limits. | | | |
| Wild Turkey Bearded Turkey Only | ****April 10-May 8 | 1 | 2 | 2 |
| Resident Canada Geese | Sept. 8-Sept. 10 (west of I-95 only, permit required) | 2 | 4 | None |
| Migratory Waterfowl | Unavailable at this time; Federal regulations may be obtained by contacting license agent or writing N.C. Wildlife Resources Commission after October 1, 1992. | | | |

*One of which must be antlerless

** See *1992-93 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest* for approximate boundaries of Eastern, Central, Northwestern and Western deer seasons. For a copy of the *Digest*, write: N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, N.C. 27604-1188.

*** Total limit of 8 squirrels per day of which one can be a fox squirrel.

**** Season varies from location to location; see *1992-93 Regulations Digest*.

# NATURE'S VINEYARDS

The muscadines, including the famous Scuppernong, are full of September sun, and when we eat them off the vine or drink their sweet distillations, we surely have a taste of history.

written by Bland Simpson ©1992
illustrated by Walt Obman ©1992

The call came in the middle of a balmy September Saturday morning, and before the hour was out, I was bouncing along in the bed of my neighbor Eric's Ford pickup, joining him and his family in a harvest tour of Bingham township in southwestern Orange County. We went looking for wild grapes, and we found them aplenty.

Down Millikan Road we went, a four-digit dirt road that my children would years later call "Milk-can," then back down farm and forest lanes with neither numbers nor names. Our grape picking technique was simple, elegant even: whenever we espied a cascade of vines, Eric would pull up under the most critical mass of them and then his wife, son, daughter and I—all of us in the truck-bed—would stand on the roof and sides of the truck and each grab a clutch of vines and shake it like what used to be called the dickens. The fat and aromatic blue-black grapes pelted us, rained down on us, noisily falling into the truck-bed where we scooped them up into small baskets. We must have taken 40 or 50 quarts, eaten half that much while we were out, and still left a gracious lagniappe for the birds and squirrels.

It was the first time I'd been in on such a mobile, high-technology harvest, though I had on occasion shaken some healthy gold-and-green grapes into my canoe down in the Great Dismal Swamp. And I know for a fact that a couple of hungry fishermen, two Jims from Raleigh, once engaged in similar sport and filled a johnboat bottom down on the Black River. No records exist that would tell us how many tens of thousands of others have gone out and done likewise, but, in all of this, we were just doing what has come abundantly natural to us Carolinians since the first of the land-bridge pilgrims made it this far east thousands of years ago, looked up into the trees, and saw what September had in store.

What have we been shaking down from all these pendant vines?

John Lawson, Carolina's peripatetic natural historian and reporter, told the world in 1709 that "Among the natural Fruits, the Vine first takes place, of which I find six sorts, very well known." These he called "black *Bunch-grapes*, which yield a Crimson Juice," "another sort of Black-Grapes like the

*Like Jove's locks awry,*

*Long Muscadines*

*Rich-wreathe the spacious*

*foreheads of great pines,*

*And breathe ambrosial*

*passion from their vines.*

*—Sidney Lanier,*

*"Corn," 1874*

former, in all respects, save that their Juice is of a light Flesh-Colour, inclining to a White," and "*Fox-Grape*... two whereof are called Summer-Grapes, because ripe in *July*; the other two Winter-Fruit, because not ripe till *September* or *October*."

However Lawson's *six sorts* correspond to the seven species of native grapes identified two and a half centuries later in Radford, Ahles and Bell's *Manual of the Vascular Flora of the Carolinas*, most likely when we wander out and tug at the vines in the woods, we are rewarded with muscadines (*Vitis rotundifolia*).

Most muscadines are big purple-to-black grapes, the main one of our natives that shows up everywhere, all across the state. One nickname for this species—bullace grape—derives from from its color similarity to the damson plum, or bullace. And a certain bronze-green sport, or variety, of the wild muscadine bears one of the best known names in our state's and nation's viticulture: *Scuppernong*.

This grape, once also called the White Grape, the Big White Grape, and the Roanoke, gained popularity and noteworthiness as a wine grape on the south side of Albemarle Sound, and in 1811 was named after Scuppernong River, Scuppernong Lake (now Lake Phelps), and the settlement of Scuppernong—not the other way around. These are all down Washington and Tyrrell County way, in and around Columbia. And, according to Clarence Gohdes, the man who wrote the book, *Scuppernong*, this namesake work comes from the Algonquian *askuponong*, which means "at (or in) the place (country) of the *askupo*," the *askupo* being the sweet bay, or *Magnolia virginiana*, a small evergreen common to our low grounds.

When I stopped in at Bayside Plantation and watched Frank Hollowell planting scuppernongs down in Pasquotank in 1973, I first learned through this retired Navy commander of other up-and-coming growers like the Woods in Chowan, and the Sells in Brunswick (who perfected an absolutely dry scuppernong wine). They were only following an old tradition, for North Carolina had a century and more before then been an American leader in exploiting its native grapes.

Samuel Huntington Perkins, a Yale graduate on his way to tutor the young at Lake Landing plantation on the southeastern shore of Lake Mattamuskeet, arrived at Roanoke Island on the last Sunday in October, 1817: "Landed on the small & barren island of Rhoanoke," he wrote in his diary. Two days later his opinion of the island had improved: "I spend my time here more agreeably than could be expected. The Island is 10 miles long, & 2 broad. It abounds in Deer, Racoons, & Possum. The fig & grape here arrive to perfection. The inhabitants supply themselves with good wine, but manufacture little or none for exportation."

Word got out. Author Gohdes reports that Thomas Jefferson got wind of the scuppernong and in June of 1823 ordered through a Plymouth factor named Cox a 30-gallon barrel of "the pure juice of the grape." By 1840, North Carolina was the premier wine-making state in America, and the largest vineyard here was a 6-acre farm at Brinkleyville in Halifax County. Sixty years later another Halifax vintner, a man of prodigious energy and viticultural skill named Paul Garrett, won a prize in Paris for scuppernong wine. In 1904, a sparkling scuppernong called Paul Garrett's Special Champagne took top honors at St. Louis' Louisiana Purchase Exposition. Within a few years, writes Gohdes, Garrett's sweet Virginia Dare wine was "the most popular vinous drink of the United States."

But scuppernong needn't get all the attention, for other kinds of muscadine have turned up in the Tar Heel woods and well pleased their finders: the William Flowers variety, found in 1816 in a swamp south of Lumberton; the Mish, come upon by a Little Washington farmer in the 1840s; and the James from Pitt county, dating to the mid-1860s.

Further upstate in our Piedmont and mountains, the fox grape (*Vitis labrusca*) thrives. One variety of fox grape, the Catawba, was apparently first found along the banks of Cane Creek south of Swannanoa in Buncombe County, and Catawba wine also became a popular ante-bellum spirit well outside the South—it fortified Harriet Beecher Stowe in her literary campaign against slavery.

Our other wild vines are the frost grape (*Vitis vulpina*), the possum grape (*V. baileyana*), the widespread summer grape (*V. aestivalis*) and its mountain variety the silverleaf grape (*V. aestivalis argentifolia*), the pigeon grape (*V. cinerea*) and the riverside grape (*V. riparia*). The late, noted Charlotte gardener and columnist Elizabeth Lawrence declared the fruits of what she called the riverbank grape to be "worthless," but she saluted the fragrance of its flowers, and that of the frost grape's blossoms as well. All of these typically bear much smaller fruit than the muscadine and fox grapes, and none of them are known for wine.

But if I were a pileated woodpecker in the Roanoke River hardwood bottoms, I'd have far more interest in food on the fly than in the end result of fermentation. Nature Conservancy land-rover Merrill Lynch told me he had once seen a pileated gorging himself on wild grapes along the Roanoke. And there was more to Merrill's entertainment than watching the big bird feed: "All

the vines grow to huge sizes in those eastern floodplains," he said. "There was a big grapevine down on the Roanoke, like a Tarzan vine, 4 or 5 inches thick—you could get up and swing on it."

The grapevine swing I most remember was domestic, in my great-aunt Jenny's and great-uncle Harold's backyard on Main Street in Elizabeth City. Their large arbor must have covered an area at least 16 feet by 20, and the vines twined around a trellis tall and sturdy enough for a child's swing to arc up underneath. It was a cool place, a wonderful creation for Jenny's and Harold's many young kin.

The other grand vine I recall from that time, though, was totally wild, and it stands as a monument in my memory of the Outer Banks 40 years ago. Our family was fortunate enough to have a modest cottage on the Atlantic at Kitty Hawk, at a time when there was nothing west of the beach road except the sands and a few grasses. It was over a mile from the cottage across this desert back to the Kitty Hawk woods, where the sand fell away at a steep angle fully 50 degrees and 30 feet down into the woods. My cousins and I, after the age of about 7, were given free rein to roam this desert—there was no traffic, usually no one else out wandering the sand in the summer heat except ourselves, and our folks could see us all the way on our trek out and back, about two hours in all. My father warned us not to slide down the western sandbank, because, he said, we might not be able to get back up the incline and out of the woods and the bears there might get us—only once did we disobey and try the slope, and seeing what he meant, scrambled back to safety and ever after stayed up on the plain. The forest was not our goal anyhow.

About 200 yards seaward of the woods stood the only elevated point on that desert plain. Always we hiked for this mountain, no more than a mound really, perhaps 20 feet tall and 40 feet long, and 20 or 30 feet thick—it was absolutely green with honeysuckle and Virginia creeper and wild grapevine, and stood out like an emerald against all that bright sand. We climbed and clambered all over it, drank the Lilliputian servings of honeysuckle and in Indian summer ate our fill of grapes and had us a prize place we believed all our own.

I thought about this long-gone and leveled treasure last fall when, here at home in Orange County, my wife Ann and the twins and I—drawn by the scent—ventured into a dogwood and sourwood patch that was covered with wild grapes and shook loose a couple of quarts that we carted off in baseball caps. It was that nectarous smell, I suppose, that made me remember how I used to lie in my bunkbed on the western end of the house at Kitty Hawk watching the grapevine hill show up in faraway silhouette as heat lightning lit the night sky, knowing though never forming the thought that I was among Raleigh's latterday colonists, and that the ruby and silver and gold he sought had been here all along, and are still presenting themselves each fall in wild vineyards all across the realm and hanging from lianas that tie us with a touch to the wild and wondrous earth. ☒

# Big Sweep Rides Again

In 1991, Big Sweep volunteers gathered 212 tons of trash, including plastic bags, cans, bottles, cigarette butts, Styrofoam, six-pack rings, fast-food packages, refrigerators, mattresses, fishing line—and two dead cows.

written by Carla Burgess
photographed by Melissa McGaw

What do a stray tennis ball from Tanglewood Park in Winston-Salem, a basketball from a North Wilkesboro team, 7,000 pounds of tires and two dead cows have in common? They all ended up in High Rock Lake after a southbound journey on the Yadkin River. With the exception of the bovine debris, the items were among 17 tons of waterborne litter collected and recorded by nearly 500 volunteers during the Big Sweep cleanup last September.

The cows were swept up by the Yadkin's swift currents during heavy rains this past spring, says Robbie Cole, recreational inspector for Yadkin Inc., the power company that owns the 15,000-acre reservoir. The animals were lassoed and hauled in during a routine cleanup near a dam on Tuckertown Lake along with 300 truckloads of debris, mostly limbs and scores of plastic soda bottles. Keeping logs of their trashy finds has become a habit with Cole ever since High Rock joined the Big Sweep in 1990. Begun as a beach cleanup in 1987, the effort swept inland in '89 to include lakes, rivers, streams and any puddle or pond that volunteers want to clean.

During Big Sweep '91, 12,500 volunteers collected 212 tons of garbage at more than 300 sites from the mountains to the coast. When volunteers hit the shorelines for the sixth annual cleanup Sept. 19, coordinators anticipate 20,000 volunteers representing all 100 North Carolina counties. First Citizens Bank, the title sponsor for the cleanup, coined this year's slogan, "We've Had It Up To Here With Water Pollution."

"There's more to it than just picking up trash," says Big Sweep's executive director Susan Bartholomew. "Volunteers record everything they find on data cards, and we use the information to help tailor our educational efforts."

Cole says Yadkin has learned a lot from the data. Big Sweep cleanups everywhere have shed light on the problems caused by polystyrene (plastic foam) and other plastics in the aquatic environment. Plastic pellets clog the stomachs of waterbirds; turtles and other animals strangle on discarded fishing line. "On High Rock, we have phased out the Styrofoam blocks under piers," he says, adding that residents and other recreational

***Big Sweep began** as a volunteer beach cleanup in 1987 and has since spread its efforts inland to include freshwater streams, rivers, lakes and impoundments. About 12,500 volunteers participated last year.*

users have become concerned about pieces breaking off into the water.

High Rock is the upwardmost reservoir on the Yadkin, which originates at Blowing Rock, and Cole says that whatever people toss in will eventually make its way downstream. "As long as their water intake is north of what they discharge, they couldn't care less," he says of this Piedmont county's northern neighbors.

Although that North Wilkesboro basketball probably became a Big Sweep statistic inadvertently, its 100-mile journey confirms what the cleanup's coordinators already know—that our waterways have become corridors for a stream of garbage. They also know that a four-hour cleanup once a year is not enough to curb the calamity. That's why Big Sweep focuses on education and public awareness year-round.

The first educational product of Big Sweep came off the presses just before the 1990 cleanup. *Ripples: A Big Sweep Elementary Activity Guide* was designed to teach 9- to 11-year-olds about the problems caused by aquatic litter. Funded by the N.C. Wildlife Resources Commission and the N.C. Wildlife Federation, more that 16,000 copies were distributed to schools, 4-H clubs, Scouting groups and church organizations.

"The education committee thought *Ripples* was a fitting debut for our educational campaign," says Lundie Spence, marine education specialist for Sea Grant and co-founder of the cleanup. "Children are sensitive and receptive to messages about environmental stewardship. And they take those lessons back home with them, where it reaches adults in the household too."

Next, Big Sweep purchased 500 copies of a video and an educational manual that promoted community recycling education. The video, "Full Circle," and the accompanying manual, *Garbology,* were distributed to county school superintendents across the state.

In August, Big Sweep published another educational manual, *Splish Splash*, geared toward 5- to 7-year-olds. Children were a natural choice for Big Sweep's educational outreach. But other groups have been targeted as a direct result of data gathered from the cleanup.

When cigarette butts won the dubious distinction as the number one litter item collected in 1990, the manufacturers took notice. R.J. Reynolds responded with an educational campaign aimed directly at their consumers. Working with Big Sweep, the company launched a "Don't Leave Your Butt on the Beach" promotion that included tentcards and billboards. Through Big Sweep, the company also made and distributed more than 10,000 portable pocket ashtrays.

The data has also spurred positive community responses. "When we first started participating in Big Sweep five years ago, the towns had no garbage cans out on the beach itself," says Diane Warrender, director of Carteret County Keep America Beautiful and a cleanup coordinator.

Before Beach Sweep '88, the towns of Atlantic Beach and Emerald Isle were so chagrined at facing a second year of publicity about large volumes of litter, they sent municipal cleaning crews out the day before to clean the beaches, Warrender says. Now the towns send four-wheel drive vehicles up and down the beach regularly to empty the 10-plus garbage cans that have been placed at the base of the dunes.

Plastic six-pack rings were another glaring problem and a big culprit in wildlife entanglement. "The perception is that there are millions and millions of animals that are being strangled by six-pack rings," says Lois Nixon, who heads up Wake County Keep America Beautiful and coordinates Big Sweep cleanups in the Triangle area. "But it is a litter issue also."

She thought that if the rings could be recycled, more of them could be kept out of the waste stream. Nixon telephoned ITW/Hi-Cone, the manufacturers of the six-pack rings, in Chicago. As part of a pilot program, the company sent "six-pack trees," on which students could hang rings they brought from home. Then the yokes were sent to the company's recycling plant in Zebulon.

"For every five rings the kids brought in they got a sticker that says, 'Don't Teach Your Trash To Swim,'" says Nixon. As a result, 56 elementary schools in Wake County recycled 105,250 six-pack rings—totalling 842 pounds—in six months.

At the start of this school year, 600 other North Carolina schools joined the forest of six-pack tree recycling. "This gives us an opportunity in 650 schools across the state to talk about the entanglement issue and the litter issue in conjunction with Big Sweep," she says.

At an elementary school in the mountains, students made Big Sweep a classroom project, using the cleanup as fodder for essays, and the data as building blocks in math assignments. In Onslow County, students wrote letters to legislators, voicing their concerns over water pollution. In other areas, students led efforts to stop helium balloon releases at school functions.

***With the training*** of tomorrow's grown-ups in good condition, Big Sweep has taken on a greater educational challenge—the people old enough to know better: adults. As counties across the state impose tipping fees to offset the cost of waste disposal, rivers have filled with rubbish, and lakes have turned into landfills. Mattresses, shopping carts, appliances, tires, car batteries and other spoils are becoming as common along inland sites as cigarette butts on the beach.

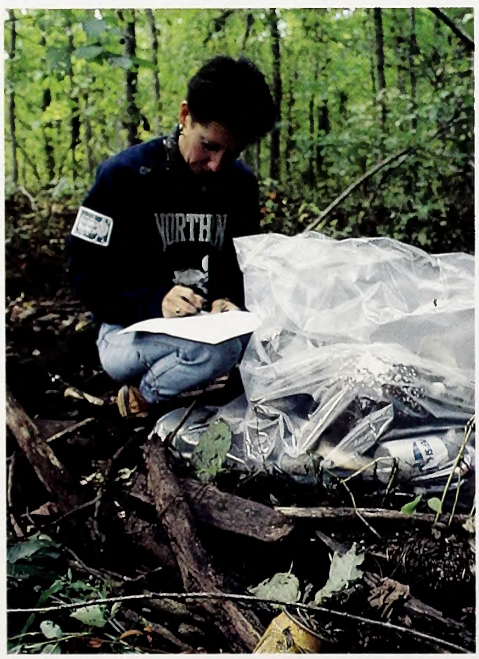
Teaching beach-goers not to leave their cigarettes on the shore is one thing. Getting people to stop shoving their sofas, refrigerators and rusted truck beds into the nearest creek is another. "If they don't feel the ownership or the sense of pride in those areas and don't mind dumping on them, they're going to be tough to educate," says Nixon. She sees tougher enforcement as the key to solving the problem.

Lundie Spence tells a story of a Big Sweep coordinator on the Outer Banks who discovered some people dumping a load of household trash along a roadway one morning. When confronted, the people complained that the landfill was closed. It opened at 10 a.m., Spence says. "People who are dumping these large appliances and mattresses because of the short-term gain of convenience are going to have to pay up in the future," she says.

"It's a long, slow process," adds Bartholomew. "You can't change overnight habits that have taken a lifetime to develop."

Over the past few years, bait cups, plastic bags and bottles and monofilament fishing line have taken top billing on inland data cards. "Based on the data collected in the past couple of years, we're finding that a lot of

***When trash is collected,*** *volunteers record all the types they've found on data cards. The information can then be analyzed and used to target anti-litter educational efforts.*



***Volunteers collect** all types of trash, from monofilament fishing line to mattresses. Monofilament discarded by careless or uncaring anglers is a deadly form of litter since a wide variety of birds, mammals and fish can become entangled in the line and die.*

trash is being left behind by recreational boaters and fishermen," says Bartholomew. Although many boaters participate in the cleanup, and groups such as Power Squadrons have begun to get involved, coordinators know there's still a lot of room for attitude adjustment. Big Sweep's educational outreach has targeted wayward fishermen and boaters with brochures describing the hazards of stray fishing line and other plastic litter—from propeller entanglement to wildlife deaths. A coalition of power companies across the state funded a series of posters to be distributed to bait and tackle shops and other fishing licensing outlets. The second poster featured NASCAR driver Richard Petty and the message "Don't Splash Your Trash."

Petty says the focus on raising public awareness is the essence of Big Sweep. "It's not cleaning it up," he told a gathering of coordinators and sponsors in June. "It's educating the people so it's not out there." Bud Caywood, who serves on the Big Sweep executive board and who is coordinating the fourth consecutive cleanup at Lake Hickory, agrees wholeheartedly. "I remember seeing a cartoon a long time ago, and as far as the eye could see there were trash barrels labeled 'Help Keep Our Beaches Clean,'" he says. "By putting trash cans out, we're just putting a Band-Aid on the problem."

Like many true patriots of the Big Sweep cause, Caywood finds himself following litterbugs every time he vacations. On a beach trip last June, he passed out 200 portable ashtrays to people along the seashore. And he told one woman about to abandon her empty beverage cans what she should do with them.

"It says a lot that all of these people work together to make this whole program happen," says Bartholomew. "When they say Big Sweep is a year-round educational program, our coordinators take it to heart. They really practice what they preach."

Caroline Parker, who heads up the Wayne County KAB program and oversees cleanups in the coastal plain, says recreational users are starting to view plastics and other waterway litter as the dangers that they are. "Fishermen are telling me they're seeing entangled wildlife, and they're getting plastic bags sucked into their boats' water intake and watching their motors burn up," she says. "They're beginning to be more concerned about the quality of the resource.

"That's a good sign," says Parker. "Who should care about it more than the people who use it?" Parker, who added farm ponds to the growing list of waterways cleaned, says volunteers are diligent in their pursuit of rural streams and creeks to clean. I've had folks who were cleaning what was almost a drainage ditch because they realized it flowed into a big water supply," she says.

Big Sweep is known for the heavy-hitters in its educational batting cage. Anne Hice, education specialist for the Wildlife Resources Commission, is already envisioning a monofilament recycling program in the cleanup's future. Hice has contacted a fishing-line manufacturer in Iowa that has agreed to place bins for recycling at sporting goods outlets and bait and tackle shops. Educational brochures and posters at those sites could highlight the predicament of this monofilament mess, she says. Ornithologists who monitor coastal areas say they rarely pay a visit to a colony of waterbirds without discovering the horrors of fishing line entanglement. Walker Golder, who oversees the Audubon Society's coastal islands program, says he has found as many as five dead pelicans fatally entangled in the same piece of fishing line.

Sometimes, Hice says, the subtle messages are the most powerful. While leading a field trip to Fort Macon recently, she paused to pluck a small, resealable plastic bag from the sand—almost a reflex action for her. She overheard the kids discussing it among their group later in the day. "That action transferred in their little minds," she says. "From now on when they see it, they'll know to pick it up."

Big Sweep takes place through the cooperation of a host of coordinating agencies and organizations: First Citizens Bank, UNC Sea Grant, N.C. Division of Environmental Management, N.C. Division of Coastal Management, N.C. Division of Water Resources, N.C. Division of Parks and Recreation, N.C. Wildlife Resources Commission, N.C. Wildlife Federation,, N.C. 4-H, Keep America Beautiful, Keep North Carolina Clean and Beautiful, WGHPiedmont in High Point, WRAL in Raleigh, WSOC in Charlotte, WLOS in Asheville, WWAY in Wilmington and WITN in Washington.

To find out how to participate, pick up a brochure at your local First Citizens Bank. Or call the Big Sweep MCI hotline at 1-800-27-SWEEP. ⊡

# A GIFT OF WILDLIFE

## Down in Rockingham, a 200-acre memorial to a beloved daughter serves as the pilot in a new series of special wildlife areas.

written by Vic Venters
photographed by Melissa McGaw

Picture this: a beautiful 40-acre millpond surrounded by hundreds of acres of forest on high ground. Located in the midst of a growing city, it would have made a nice housing development and its owners rich had it been sold on the open market.

But that's not what Marion Lee Hinson and his wife, Nona P. Hinson, had in mind for their tract of land. Instead, they donated it to the N.C. Wildlife Resources Commission in honor of their late daughter, Nona Lee "Pitt" Hinson Cohen.

Their 200-acre parcel and pond, located within the town limits of Rockingham, has become a Wildlife Conservation Area, the first tract to be managed as such by the Commission. Wildlife Conservation Areas are a new designation of Commission lands that will be managed primarily for non-game wildlife and educational purposes.

Since the Hinson's generous donation, the Wildlife Commission has also assumed management of 20 small coastal islands under the Wildlife Conservation Area designation to protect nesting shorebird and sea bird species. The islands, some of which are spoil islands from dredge material, are scattered along the coast from Oregon Inlet south to the mouth of the Cape Fear River.

Prior to the creation of the new designation, all lands owned, leased or managed by the Wildlife Commission were managed under the Game Lands category. Currently, about 2 million acres are enrolled in the Game Lands program and are open to regulated hunting, fishing and trapping.

Wildlife Conservation Areas will still allow these traditional recreational uses where applicable, but the lands will not be primarily managed for these activities. For instance, fishing will be allowed on Hinson Pond, although no outboard motors will be permitted. However, because of its urban location, hunting and trapping—which could be allowed on some areas—will not be allowed here. The Wildlife Commission plans to begin sampling the lake this year to determine if game-fish populations are balanced and whether the lake needs additional stocking or management.

***Nongame section leader** Randy Wilson (left) congratulates Marion Lee Hinson (right) who, with his wife, Nona, recently donated their 200-acre parcel and pond to the Wildlife Commission in memory of their late daughter, Nona Lee "Pitt" Hinson Cohen. The area will be managed under a new designation as a Wildlife Conservation Area, to be used chiefly for educational and nongame wildlife purposes.*

The Commission also plans to put in nature trails at the Hinson tract and use the area for environmental education featuring nature study activities. Biologists will also be conducting wildlife enhancement activities such as erecting squirrel, wood duck and songbird nesting boxes.

Likewise, the 20 coastal islands managed as Wildlife Conservation Areas are closed to the public from April 1 to August 31 to protect the fragile breeding habitat of the 23 bird species that nest there.

The Hinson tract contains a mixed pine/hardwood forest, trails and the 40-acre millpond, built by Marion Hinson in the mid-1930s with the assistance of the Civilian Conservation Corps that had a camp located on the site through the Depression years.

"Our daughter Pitt was always very much interested in ecology and wildlife," her father explained. "She loved to fish, too. She studied biology at N.C. State University and went on to work with birds at the zoo down in Columbia, South Carolina."

"We're making this donation in memory of her," he added. "I think she would have liked that."

Wildlife Conservation Areas offer the Commission increased flexibility in land acquisition efforts. "This designation fills a void in providing environmental areas for the public," explained Randy Wilson, section leader for the Commission's Nongame and Endangered Wildlife Program. "Many areas like this are not suitable for Game Lands management because they are too small or are located in urban locations. Yet they are still valuable areas for both wildlife and for people to learn about wildlife."

"This land will make a great place for school children and Scout troops to learn about wildlife and environmental issues," Wilson elaborated. "Right now, we're working on getting a local group to adopt the area and assist with its management. As the state population grows and more natural areas are lost to development, people will increasingly need places like this to learn about wildlife, to come fish, or just relax with a walk through the woods."

There are tax incentives for land donations as Wildlife Conservation Areas. For more information, contact Randy Wilson, N.C. Wildlife Resources Commission, Nongame and Endangered Wildlife Program, 512 N. Salisbury St., Raleigh, N.C. 27604-1188.

*Water Still Too Salty*

# Poor Reproduction in Currituck Sound Keeps Bass Fishing Slow

*Written and Edited by Vic Venters*

N.C. WILDLIFE RESOURCES COMMISSION

***High salinity levels** continue to plague bass reproduction and fishing success at once-renowned Currituck Sound. Potential declines in water quality may also be affecting the fishery.*

High salinity levels continue to plague Currituck Sound, delaying a return of the once-legendary bass fishing found in the 40-mile long brackish water estuary. "Bass fishing has been only fair this year," said Pete Kornegay, the Wildlife Commission's fishery biologist for District 1 in northeastern North Carolina.

In mid-summer, Currituck salinity levels averaged about 4 parts per thousand, or about 12½ percent of seawater salinity levels. "You can find adult bass in water this salty, but you don't get successful reproduction," Kornegay explained. "Bass can't reproduce when the levels get above about 3 parts per thousand or about 10 percent the salinity of seawater."

In the 1960s and '70s, Currituck Sound supported one of the nation's finest brackish water bass fisheries. Catches of 50 to 100 bass per day were common and fly fishing was a popular technique in the Sound. In the 1980s, fishing declined drastically as salinity levels increased and bass reproduction suffered. A series of back-to-back droughts were undoubtedly responsible for much of the increasing salinity. "Currituck Sound has relatively small watersheds draining into it, so when it doesn't rain, salinity creeps up from the south," Kornegay said. "Droughts in 1985 and 1986 were especially bad."

Commission biologists were somewhat optimistic that good fishing might return when the rains came again. Due to good rainfall and decreasing salinity, Currituck bass reproduction was successful in 1989 and 1990. Biologists had hoped good fishing might return by the early to mid-1990s.

Unfortunately, reproduction was only fair in 1991 due to increased salinity, with reproduction observed only in the upper reaches of the sound. Two Nor'easter storms in the fall of 1991 also washed salt water into the sound and contributed to elevated salinity levels. "We haven't had the rains we needed this spring to get levels back down, so reproduction was probably poor," Kornegay said. "Until normal rainfall returns to northeastern North Carolina and salinity drops below 10 percent for a few seasons in a row, consistently good freshwater fishing will not be found in Currituck."

Biologists also speculate that water quality in the Sound may be suffering from extensive development that has occurred in the nearby Virginia Beach area and on the Outer Banks. "There are already some problems spots from septic tanks around trailer parks," Kornegay said. "A canal that drains runoff from industrial and commercial areas near Virginia Beach is also of concern."

Historically, salinity levels have fluctuated in Currituck as a result of rainfall patterns, storms and inlets opening and closing. Eventually the rains will come again, and, maybe, good fishing too. That is, if the water flowing into the sound remains clean.

*Nature Conservancy Buys Land*

# Rare Carolina Piedmont Prairie Parcel Saved Near Charlotte

A fragment of one of the world's rarest ecosystems was saved this summer when The Nature Conservancy, N.C. Chapter, purchased an 11.6 acre tract of Piedmont prairie. The parcel, located about 25 miles south of Charlotte, is one of the few remaining parts of a far more extensive prairie ecosystem that was found in sections of Piedmont North and South Carolina in pre-European settlement days.

Herds of bison and elk once roamed these eastern prairies which were kept open by grazing and fires set by lightning or Native American Indians. Since European settlement, agriculture, urban development and fire suppression have long since destroyed virtually all of the prairies. The bison and elk were extirpated shortly after the American Revolution.

The site is also home to the federally endangered Schweinitz's sunflower, a prairie sunflower species known to exist only in 15 other scattered sites in North and South Carolina, all within about 90 miles of Charlotte. The sunflowers and prairie grasses are now found only near power line right-of-ways, highway right-of-ways or pastures where annual mowing prevents trees or other brush from growing and shading out prairie plants. Schweinitz's sunflower produces a bright yellow flower in late-September. The sunflower also produces a large tuber system of roots, a characteristic commonly found with fire-dependent plant species.

The glade is one of the largest remaining prairie fragments known to exist and was purchased from two landowners. The Nature Conservancy, N.C. Chapter, is working to purchase a total of 30 acres around the site and plans to manage the area as one of its 56 preserves.

The prairie ecosystem was originally found in the Piedmont Carolinas because of the presence of Zion soil, a type of poorly drained clay that helped retard the growth of most trees, thus allowing prairie grasses and plants to flourish.

N.C. NATURAL HERITAGE PROGRAM

***The large underground** tubers found on the Schweinitz's sunflower are typical characteristics of fire-dependent plants found in prairie ecosystems.*

N.C. NATURAL HERITAGE PROGRAM

***Schweinitz's sunflower** produces a yellow flower in late-September and the plant can reach heights of 10 feet. This endangered prairie plant is found only within a 90-mile radius of Charlotte.*

## Rare Species Booklet Available

The Nature Conservancy, North Carolina Chapter has recently published a full-color booklet featuring 15 rare or endangered plants, animals or ecosystems found in North Carolina that the Conservancy is protecting. The booklet was produced with the assistance of Duke Engineering & Services.

Each vignette features a color photo, short life history or description, status report, and sites where they can be found. The species featured run the gamut from red-cockaded woodpeckers and red wolves to long-leaf pines and Carolina bay ecosystems.

The booklet should prove highly useful to educators or anyone interested in North Carolina's natural resources. For a single free copy of the brochure, contact the Nature Conservancy, North Carolina Chapter, Suite 223, Carr Mill Mall, Carrboro, NC, 27510.

*Dove Populations Stable*

## Weather Important for Opening-Day Success

North Carolina dove hunters should have plenty of doves opening day this September, but they'll have to cross their fingers and hope for nice weather for the best success.

Last year, for instance, rain and muddy fields kept farmers from harvesting their corn in eastern North Carolina in the weeks prior to Opening Day. As a result, many doves were dispersed from traditional feeding fields. Hunting success was below average on many hunts.

Cool weather can also affect hunting success. "Weather fronts have a big impact on dove movements," said Carl Betsill. "The first cold fronts usually come through the state in late August or early September. Most of the doves then are juvenile birds that gather in big flocks, and they seem to wait for a change in the weather before they move. If a cold front moves through, these flocks often move south or scatter. They can be in a field one day and gone the next."

The U.S. Fish and Wildlife Service estimates that the nationwide population of mourning doves is about 475 million birds. On average, hunters across the country take about 9 percent of the population each year. North Carolina's mourning dove populations are roughly similar to last year's, and the state's population has remained stable over the last decade on average. "Considering the extent of widespread wildlife habitat and destruction and alteration of farm habitat in the past 10 years, it's remarkable that the populations have held up so well," said Terry Sharpe, the Wildlife Commission's small game biologist. "It's a testament to the mourning dove's adaptability and high reproductive rate."

Mourning dove populations are up almost 5 percent over last year in the eastern United States. Studies have shown that properly regulated hunting does not harm overall populations, although biologists with the U.S. Fish and Wildlife Service believe the popular gamebirds can be overshot on a localized basis. Sportsmen are urged to obey all bag limits and avoid illegally baited areas.

VIC VENTERS

***Although dove populations** remain abundant in North Carolina, weather patterns can greatly influence hunter success on opening day. Hunting hours on opening day begin at noon this year.*

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before traveling to an event.

**Sept. 19-20**

The 11th annual Currituck Wildlife Festival will feature wildlife art, woodcarvings, decoys, photography and a duck, goose and swan calling contest. The event will be held at the Currituck County High School in Barco and proceeds will benefit the proposed wildlife museum in Currituck County. For more information, contact the Currituck Wildlife Guild, P.O. Box 91, Shawboro, NC 27973, or call (919) 232-3297.

**Oct. 3-4**

The N.C. Trappers Association will celebrate its 20th anniversary convention this year at Stanly County fairgrounds at Albemarle. Guest speakers, seminars and demonstrations are planned. For more information, contact association president James Price at (704) 848-4340.

## Articles Win OWAA Awards

Articles written by Eddie Nickens and appearing in two 1991 *Wildlife in North Carolina* issues took first- and second-place prizes at the 1991 Outdoor Writers Association of America national writing contest this spring. The article, "Vanishing Landscapes," which appeared in the March 1991 special endangered species issue, took first place in the Conservation/Environment category. The article, "Bugs, Sweat and Tears," which appeared in the May 1991 issue, took a second-place award in the Camping/Backpacking category.

*CP&L Urges Caution*

## Avoid Power Lines When Shooting

It goes without saying that anyone handling a gun must be positive of what they are aiming at before they pull the trigger. Carolina Power & Light is asking hunters to exercise caution when shooting around power lines or electrical equipment in the coming season.

Hunters frequently find deer and other game near clearings where electric power lines cross the countryside.

"Please be sure to aim away from this equipment," explained Lester E. Misenheimer, manager of CP&L's Transmission Department. "Stray gunfire can damage transmission lines and cause the lines to fall. Damaged lines might fall immediately or at any time in the future."

This could injure anyone nearby, spark a fire, cause a spill of transformer cooling oil, or cause temporary loss of power for many customers.

This spring, over 25,000 people temporarily lost power when a power line was damaged by gunfire.

CP&L incurs the extra expense to repair this damage and, ultimately, this expense is passed to CP&L customers—you and me.

## The 1993 North Carolina Wildlife Calendar Is Here!

With such artwork as Robert B. Dance's "Snow at Currituck" (featured on the inside back cover), the North Carolina Wildlife Calendar is sure to sell out again this year.

The works of Robert C. Flowers, Jr., Brooks Pearce, David E. Doss, Robert B. Dance, Bob Herr, Duane Raver, Mel Steele, James A. Brooks, Joe Seme, and Dempsey Essick are featured in the 1993 Wildlife Calendar. Order yours today by returning the form below with your check or money order to 1993 Calendar, N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, N.C. 27604-1188.

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**For fund raising and bulk rate information (10 calendars or more), call 919-662-4377. Please allow 6 weeks for delivery.**

CALO93

## Wildlife Endowment Fund Report

**June 1992**

Principal Balance
$17,014,330.30
Interest Earned
$9,656,708.63
Total Receipts
$26,671,038.93
Interest Used
$4,123,817.48
Fund Balance
$22,547,221.45

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

*Scheduled Sept. 11-13*

## New Bern Sportman's Show This Month

More than 200 wildlife artists, craftsmen and conservation groups from a dozen states are expected to exhibit in the Fifth Annual North Carolina Wildlife & Sportsman's Show in New Bern the weekend of September 11-13.

In addition to paintings, photos and carvings, the show will also feature sporting arms and custom knives. Noted dog trainer Richard Wolters will conduct Labrador retriever demonstrations. Also featured will be a special live raptor exhibit by the Carolina Raptor Society, including a barn owl. This will tie into the subject of this year's poster art (pictured) by Francis E. Sweet. The print is titled "Launch Site."

For more information, contact the New Bern Area Chamber of Commerce at (919) 637-3111. For information about accommodations in the area, call 1-800-437-5767.

***Francis Sweet's portrait** of a barn owl, titled "Launch Site," is the official print for the Fifth Annual North Carolina Wildlife & Sportsman's Show.*

# Unhappy with Crappie

*by Vic Venters*

Early fall is fish-stocking time, either for any new pond you've allowed to fill over the summer or for restocking if you've removed unbalanced fish populations from an existing impoundment. You always want bass and bluegills in your pond, but some people want a little variety. What about adding crappie?

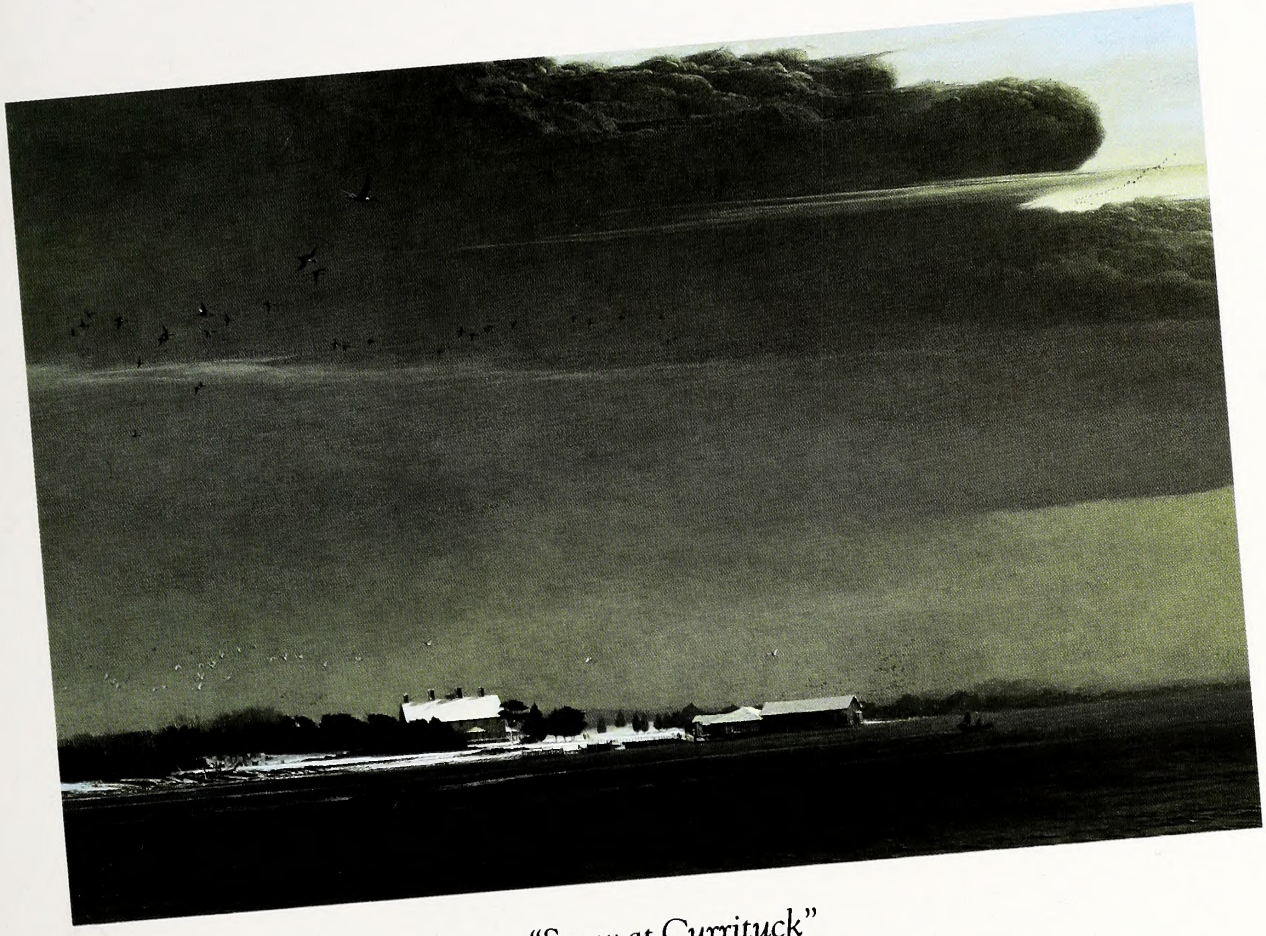
*Don't:* There are few freshwater gamefish that are better on the table than fresh-fried crappie. On the other hand, there are few gamefish that are worse to stock in a small pond. Introducing crappie into farm ponds almost always results in an unbalanced predator/prey relationship and, consequently, poor fishing. There are several reasons for this. First, crappie spawn earlier in the year than bass do, and their young may therefore prey on bass fry. When bass numbers are severely reduced, both crappie and sunfish such as bluegills are likely to overpopulate, resulting in a population of small, stunted fish.

Once hatched, crappie also have a tendency to move into deeper water faster than bluegills, thereby reducing their availability as a food source to bass. Adult crappie also have voracious appetites for minnows and other small fish. In a small pond, food resources are limited, so crappie compete directly with bass for food. In this case, chances are neither species will do well. Many fisheries biologists recommend that crappies should never be placed in an impoundment smaller than 100 acres. Stick with a properly balanced ratio of bass and bluegills for most ponds. If you want variety, you can add redear sunfish (shellcrackers) or channel catfish, but consult with an expert first.

One reason that fishery biologists consider bluegills the best sunfish species to stock is because they spawn repeatedly May through October, thereby providing bass with a steady food supply. Of course, if you harvest too many bass your pond can easily become overpopulated with any sunfish species, including bluegills. It's usually best to keep most sunfish you catch to maintain balanced pond populations. For more information on pond management, contact the Wildlife Commission's Division of Inland Fisheries, 512 N. Salisbury Street, Raleigh, N.C. 27604-1188.

*Some information courtesy of Oklahoma Department of Wildlife Conservation.*

# THE 1993 NORTH CAROLINA WILDLIFE CALENDAR IS HERE!



*"Snow at Currituck"*
Robert B. Dance

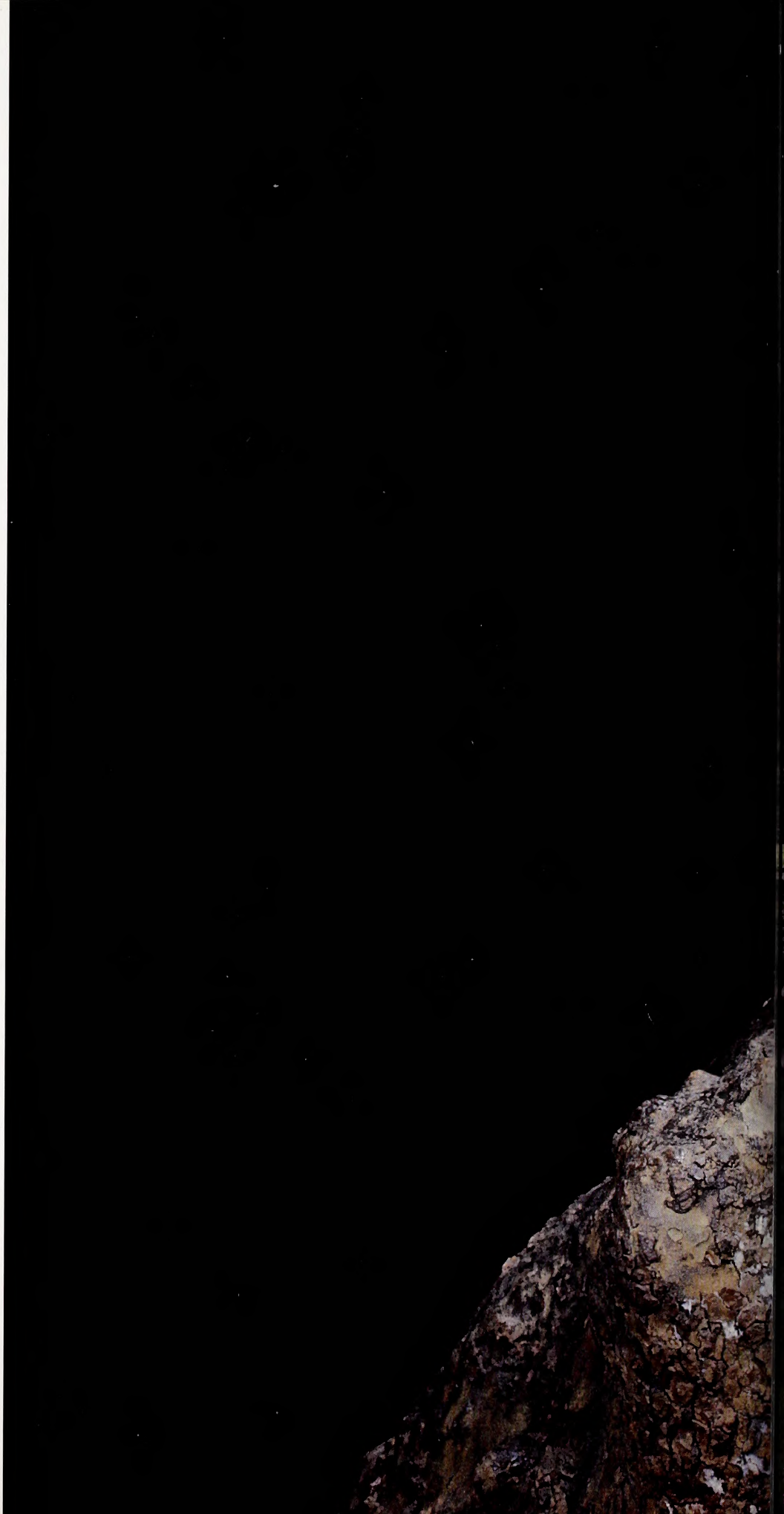
1993
December

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | November<br>S M T W T F S<br>1 2 3 4 5 6<br>7 8 9 10 11 12 13<br>14 15 16 17 18 19 20<br>21 22 23 24 25 26 27<br>28 29 30 | January<br>S M T W T F S<br>1<br>2 3 4 5 6 7 8<br>9 10 11 12 13 14 15<br>16 17 18 19 20 21 22<br>23 24 25 26 27 28 29<br>30 31 | 1<br>• Peak pelt primeness for mink, bobcat, fox, beaver and raccoon<br>• Apply to Wildlife Commission for wildlife seed | 2<br>• Snakes begin hibernating | 3<br>• Scaup migration peaks<br>• Mountain deer rut peaks | 4 |
| 5 | 6<br>• Striper fishing peaks at Lake Gaston | 7 | 8 | 9<br>Wildlife in North Carolina for Christmas.... an ideal gift.<br>Hanukkah | 10 | 11 |
| | | | | 16 | 17 | 18 |

Robert B. Dance's painting of "Snow at Currituck" is just a sample of the fine art featured in the 1993 North Carolina Wildlife Calendar. To order your calendar, see *Back of the Book* section pages 28-31.

## Robber's Roost?

These young raccoons are emerging from their den to forage, but they look more like masked bandits leaving their hideout to pull a heist. Anyone familiar with their habits would say that image is not without merit.



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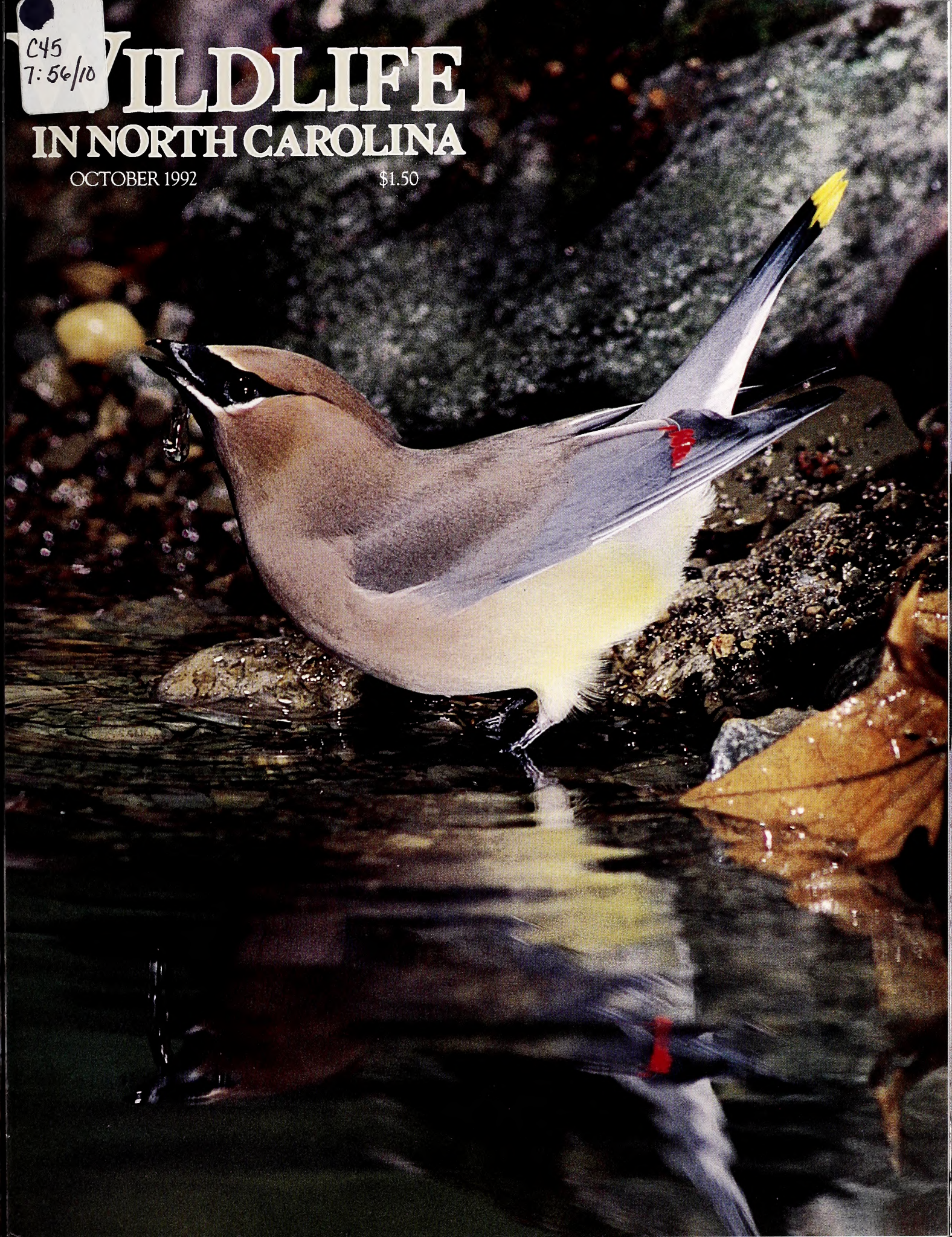

# The Last, Best Day

*by Jim Dean*

From the top of the big rock on the ridge, you can look west across the valley to the tall mountains. At this distance, they are a hazy lavender. Since 1967, when I first discovered this spot, it has been a late October ritual to stop here for a few moments before following the long, steep trail down to the trout stream.

If you lie on the rock and look straight up into the rising circle of maples and hickory, the brilliant Indian summer sky will be framed in scarlet and gold. When there is no wind to lightly rattle the leaves, there may be absolute silence—the kind that makes you strain to hear anything above a faint rush in the inner ear. That moment of utter stillness helps me recalibrate my senses for what has often been the finest day of the year.

Back on the trail, I follow steep switchbacks down the mountain through dense rhododendron thickets and into sunless coves where springs seep across mossy boulders. At spots, the trail is nearly knee-deep in leaves, and their rhythmic swish keeps time for an old bluegrass song that has come to mind. "I'd rather be in some dark hollow, where the sun don't never shine...."

JIM DEAN

Fifty-five minutes later I can hear the rush of water, and I soon break out into the flats where the ferns have already turned yellow. They seem almost luminous in the filtered light beneath the canopy of towering hemlocks and tulip poplar. Just beyond is a house-high rock that slopes down to the stream. The water is low and clear, as I had expected. At the base of the rock is a deep pool, an emerald strung by threads of white water to a necklace of shallow amber pools above and below.

A small trout is trapped in amber just upstream. I first see its shadow on the gravel, then the fish itself as it hangs there, moving slightly up and down to inspect offerings too tiny for me to see. Then it sips something from the surface.

Quickly, I remove my hiking boots, hide them under a rhododendron, then lace up the felt-soled wading shoes I've been carrying. In a few moments, the small Wulff Royal is knotted to the leader, and I stoop low and ease down the rock until I am about 30 feet behind the trout. He takes the fly eagerly.

The first fish is always a confirmation of sorts. So unspoiled is this stream, its watershed and its trout that I keep expecting to arrive and find it has all been a dream. Or worse, that it was not a dream, but a treasure pillaged while I was away. Or worse yet, that I will have to endure a patient and paternalistic explanation for its loss. It doesn't take much: a road bulldozed through the headwaters, a clearcut on the steep slopes or a few misplaced mountain chalets can spread sand and silt miles downstream. The threat is not fantasy. Two nearby streams have recently been crippled, and another has been so severely choked with sand from a new logging access road that it will not recover in my lifetime.

But this little trout, just released, hovers over reassuringly clean rocks, its golden flanks and random red spots revealing a sure lineage to the German browns that were first stocked here in the late 1800s.

A mile upstream, I find my favorite mossy glade beside the stream and take off my vest. A familiar rock forms a perfect backrest. Beside it, a second rock has just the right shape to cradle a drink while I eat a ham sandwich. In nearly three decades, only one major tradition has been abandoned. Once, I would have eaten a liverwurst, onion and ripe Liederkranz cheese sandwich, but I learned by experience that retribution was too swift. The post-lunch nap, however, is still observed.

By late afternoon, I have lost count of the trout I've caught and released, but all the likely chutes and pockets have yielded at least a strike. Most of these trout are small, but it is not unusual to catch—or rather see—bigger fish. I am looking at one now.

It lies in only a few inches of water at the tail of a long pool where an almost impreceptible side-current slides alongside a grassy, undercut bank. A mere flick of the tail, and the trout can swap kitchen for bedroom.

What to do? The trout hasn't seen me, but I am too exposed to risk retreat and mount a possibly more effective approach. Yet, if I try to cast from here, the trout will surely see the movement of my arm or the fly line. I stand motionless for what seems a long time. A light breeze momentarily ripples the water, and I use that advantage to sink to a kneeling position.

I take a deep breath, false cast over the open part of the pool where I hope the trout won't notice, then angle the cast so that the fly lands several feet above the trout. The fly floats past the spot. I try again. Then again. Nothing. I slowly stand and take a look. The trout is gone.

On the rock at the top of the trail, I sit until the far mountains are lost in darkness and the sky is vaporous with stars. Long gone is the warmth of the day, but a little lingers on the surface of the rock, and I will carry just enough of it home with me to survive the winter.

October, 1992
Volume 56, Number 10

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Cover** *A cedar waxwing pauses to take a drink at a pool. Ornithologists have only recently learned that these birds are among many that migrate south across the open Atlantic. Photograph by Steve Maslowski.*

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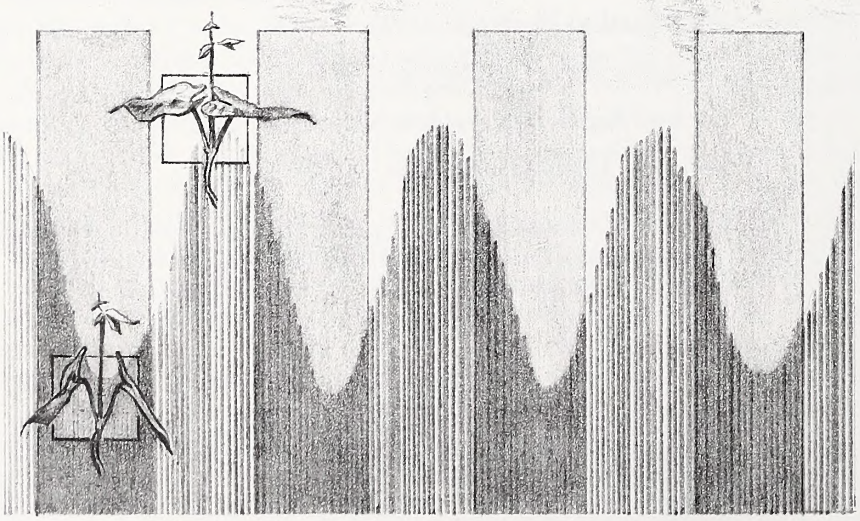
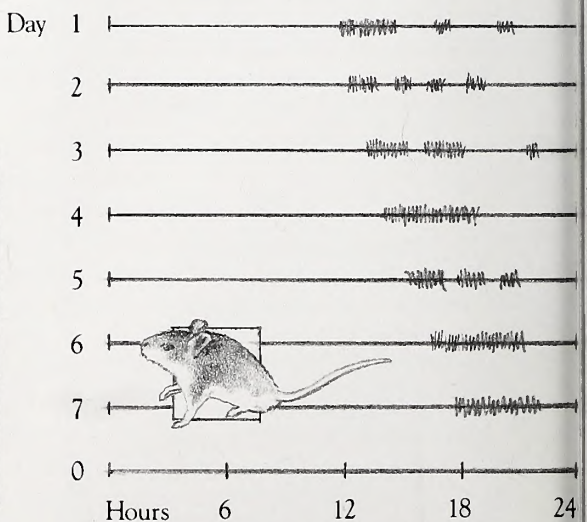
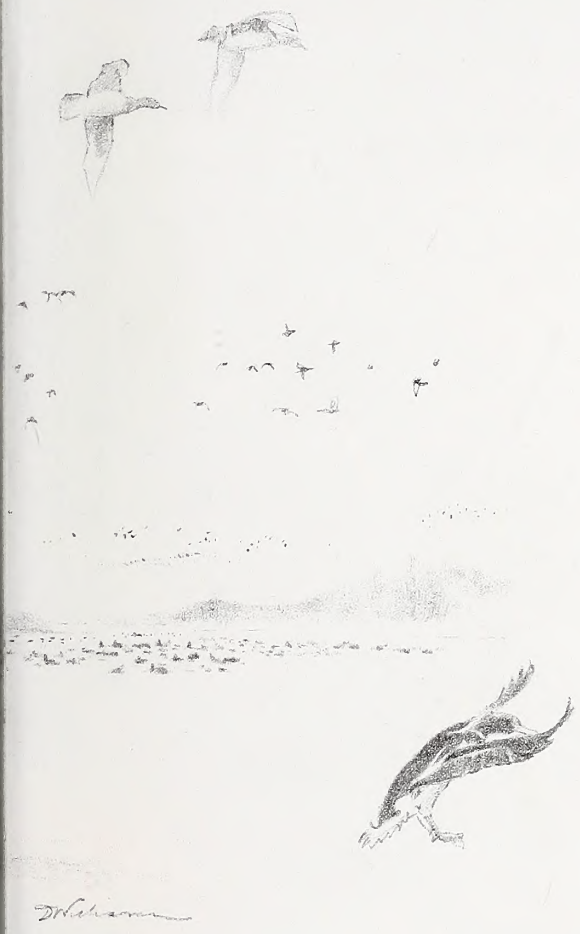



GRAPH SOURCES: MALCOLM B. WILKINS, *PLANTWATCHING* (1988), STANLEY D. BECK, *ANIMAL PHOTOPERIODISM* (1963).

***The leaves of this plant*** *rise about the same time each morning and then droop at the end of the day. In an experiment, the plant was kept in total darkness for many days yet the leaves continued to move up and down at nearly the same times. These "circadian" rhythms showed that they were based on an approximate 24-hour internal clock.*



**Are the activities** *of animals triggered by external cues such as photoperiod or by an internal clock? The shortening length of days prompts seasonal behavior such as bird migration (above), but many of the daily movements of animals are prompted by internal cues. The graph at left shows the activity patterns of a whitefooted mouse subjected to continuous light in an experiment. Normally the nocturnal mouse is most active after dark, but despite continuous light the rodent still runs at about the same time each day, suggesting that its movements are based on an internal clock. As the graph shows, the mouse runs later on each succeeding day, as if waiting for the normal period of darkness to begin.*

# How Do Birds Tell Time?

*written by Lawrence S. Earley/illustrated by David Williams*

Our woods are thronging at this time of year with avian migrants. North Carolina is the final destination of some while others stop only briefly while gathering their strength and moving on.

Migration is a complex process. Before birds leave their summer homes, they must feed heavily to put on fat to fuel them on their southern journey, move to a staging area where other birds congregate, and then wait for a cold front. And these preparations begin well in advance of the cold weather that their migration is timed to avoid.

Which prompts a couple of interesting questions. How do birds know when to start fattening up? And how do they know when to fly south?

The answer is that animals—and plants as well—can tell time. They possess some kind of an internal clock that prompts not only the seasonal rhythms of their lives, such as migration, but the mundane daily events of their lives as well. For a plant such a daily event might be the time it opens its flower petals each day. For an animal these events might include when it awakens in the morning, when it feeds and when it's most active.

For centuries, it seemed common sensical that these regularly occurring movements were controlled by the 24-hour day with its changing cycles of daylight and darkness. But experiments have shown that the presence or absence of daylight isn't what's behind the daily rhythms of plants and animals. Indeed, daylight isn't even necessary.

One experiment, for example, began by noting that a captive whitefoot mouse would run on its exercise wheel at the same time each day, just after dark. This is expected behavior for this nocturnal species. But when the mouse was subjected either to 24 hours of continuous light or to continuous darkness, it still continued to run at about the same time and for the same duration.

In other words, these daily rhythms were not the results of something outside the animal—the earth's 24-hour cycle of day and night—but of something inside it. Something like a clock set on an approximately 24-hour schedule. Other experiments have suggested a similar internal clock dictates the daily movements of plants.

These daily rhythms of plants and animals have been called "circadian" rhythms, after Latin words meaning "about" and "day." But what about rhythms that occur not on a daily basis but seasonally? Antlers begin to grow on a white-tailed deer, for example, in late winter each ear. Plants flower at their appointed time. Do internal clocks control these precise activities?

Yes, say scientists, but more indirectly. The main triggering event for these seasonal rhythms is "photoperiod," or the relative amounts of daylight and darkness that occur over 24 hours. In the case of bird migration, for example, shorter days trigger messages to the bird's brain that in turn directs a complex series of physiological and behavioral changes in the bird. Over the next weeks, the bird eats more, becomes increasingly restless and eventually flies thousands of miles south to its winter habitat. Yet something within the bird must be able to count the number of shortening daylight hours until the right number is reached.

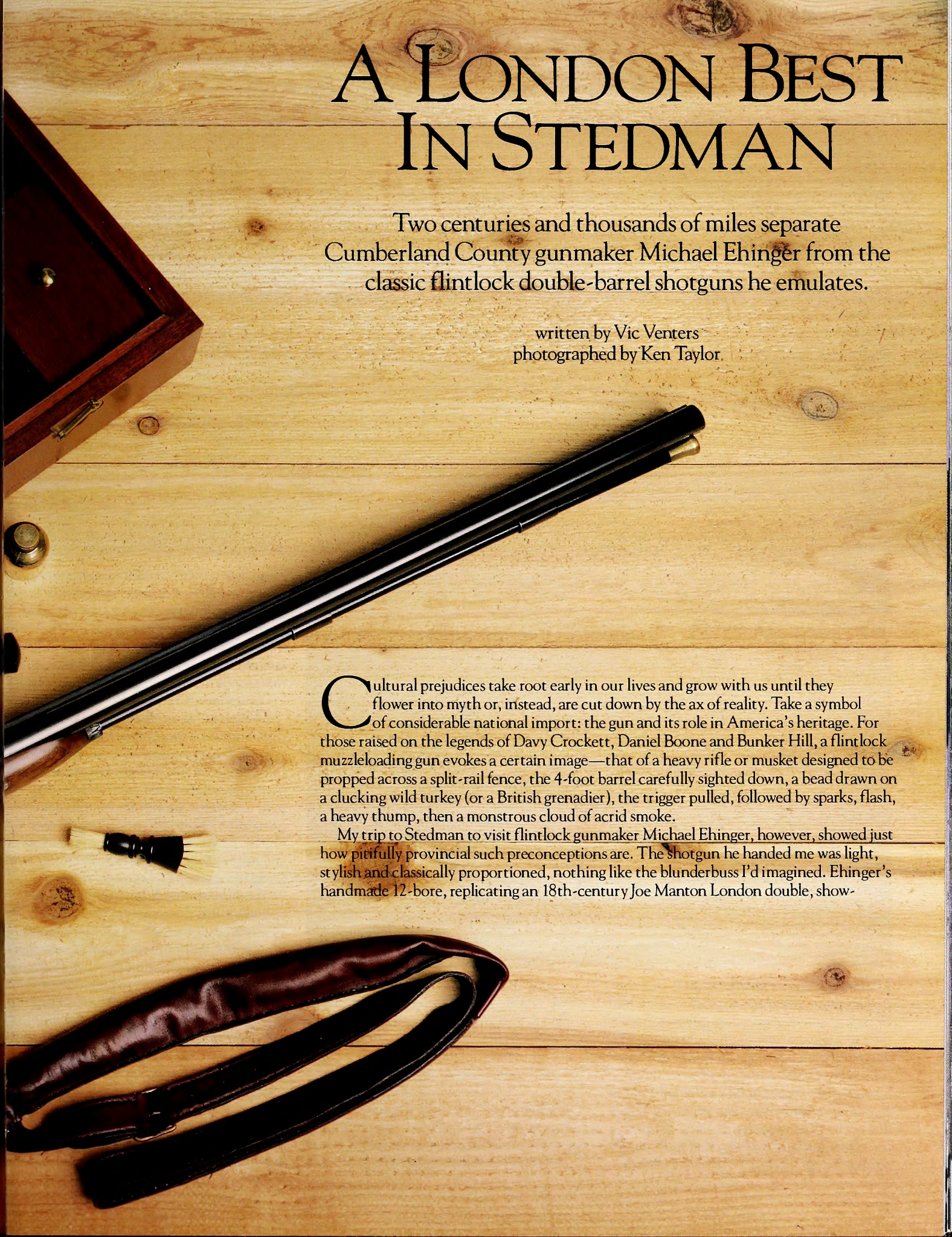
Birds have to tell time because they must anticipate winter long before its first icy touch. And trees have to put out their winter buds well before Jack Frost unlimbers his technicolor brush.

MICHAEL EHINGER
Gun, Rifle & Pistol Maker
NORTH CAROLINA

# A London Best In Stedman

## Two centuries and thousands of miles separate Cumberland County gunmaker Michael Ehinger from the classic flintlock double-barrel shotguns he emulates.

written by Vic Venters
photographed by Ken Taylor



Cultural prejudices take root early in our lives and grow with us until they flower into myth or, instead, are cut down by the ax of reality. Take a symbol of considerable national import: the gun and its role in America's heritage. For those raised on the legends of Davy Crockett, Daniel Boone and Bunker Hill, a flintlock muzzleloading gun evokes a certain image—that of a heavy rifle or musket designed to be propped across a split-rail fence, the 4-foot barrel carefully sighted down, a bead drawn on a clucking wild turkey (or a British grenadier), the trigger pulled, followed by sparks, flash, a heavy thump, then a monstrous cloud of acrid smoke.

My trip to Stedman to visit flintlock gunmaker Michael Ehinger, however, showed just how pitifully provincial such preconceptions are. The shotgun he handed me was light, stylish and classically proportioned, nothing like the blunderbuss I'd imagined. Ehinger's handmade 12-bore, replicating an 18th-century Joe Manton London double, show-

**Michael Ehinger's muzzleloaders** *are patterned after the high-grade English double-barrel fowling pieces of the late 18th and early 19th centuries. The metalwork on the gun at the top is still "in the white," awaiting case hardening for the locks and blueing or browning for the barrels. The finished lock in the lower photo has already been case-hardened and the interior parts polished.*

cased lightweight, 30-inch barrels, a straight grip, trim fore-end, seamless wood-to-metal fit and a stock carved from a piece of dark, lustrous walnut that glowed like fine Scotch. This was no clumsy hand cannon for ground-swatting a sitting grouse, but an elegant instrument for plucking flying fowl from the sky.

Chalk one up for the ax.

Ehinger has been making muzzleloading guns since 1963, first as a hobby, then, after retiring from the carpentry trade in 1980, as a full-time gunmaker. Ehinger's custom-made double-barrel flintlocks are based on guns built in London during the three decades spanning 1790 to 1820 when English gunsmiths like Joe and John Manton, Durs Egg and Hervey Mortimer pushed the flintlock to a zenith of mechanical and aesthetic perfection.

The London double gun flintlocks of this period became the archetype of a form, an ideal achieved in wood and steel; graceful lines, perfect balance, a symmetry crafted to make gun and man one for the then fledgling art of *shooting flying*—a term that meant dropping birds on the wing. The arrival of the percussion cap and, later, breech-loading cartridges would soon supplant flint and steel as a means of firing the gun, but the essential design achieved by the London fowling piece was the genesis of the modern shotgun.

Ehinger may be one of the only gun makers in the world crafting London-quality flintlock doubles today. His reasons for recreating this particular style are simple. "I've always

loved flintlock muzzleloaders," he says, "and they don't get any better than the English guns of this period. I also like to make guns for wing shooting and these are the most practical of their type. The stock measurements are essentially the same as those found on a modern custom gun in terms of length, drop and cast-off."

Shotguns like this were rarely made in America for several reasons. Unlike 18th-century Britain, where the upper class had the leisure time and wealth to pursue game as "sport," the early American hunter was looking first and foremost to feed his family. The accuracy of a rifle—by saving precious powder and shot—was more efficient and better suited for taking North America's plenteous big game populations. The result was the Kentucky (or Pennsylvania) rifle, America's great contribution to custom gun making in the muzzleloading era.

Flintlock doubles, shotguns or rifles, were very rare in America and, when made, were often thrown together using imported lower-grade British parts. Most early American shotguns were similar to our rifles: simple, single-shot weapons roughly built to withstand the rigors of frontier use. But what works for a rifle—the heavy, long barrel needed for accuracy, the steep drop in the stock—is the antithesis of the fluid balance essential for wing shooting.

Stedman is a long, long way from London, but there's nothing rough about any of the guns Ehinger is crafting there today. Each gun is made almost entirely by hand and takes 1,000 hours or more to complete. With this much time invested, he usually builds only one gun per year, sometimes two, in addition to restoring and repairing antique flintlock pieces. He builds double shotguns and double rifles—and a few pistols—though double shotguns are his stock and trade.

Ehinger uses modern machine tools sparingly—mainly for preliminary milling work and for turning down the barrels. The machinery's availability really doesn't give Ehinger any advantage over gun makers of yore, either. "The English gun trade had a guild system with different specialists working on each aspect of a custom gun," he explains. "In Manton's time, there would have been at least 17 specialists—barrel forgers, lock makers, trigger makers, metal filers, stockers, engravers and such. There was even a ramrod maker."

Ehinger is, by contrast, the gun maker. "I'm it," he says, "except for the engraving." Given the extraordinary quality of his shotguns, it's a remarkable feat, an accomplishment even more noteworthy since his skills are entirely self-taught. "There were some people building Kentucky rifles when I started," he says, "but I didn't, or don't, know of anyone making shotguns like this. I pretty much picked up what I could where I could."

***In this small workshop,*** *Ehinger typically spends 1,000 hours or more crafting each gun by hand. He also restores original period pieces to working condition.*

He credits extensive research. "I read a lot of books and did plenty of homework," he says, "but the most important thing is to have access to some good originals that you can take apart and study."

All Ehinger's guns are made to order and he usually has potential customers visit his shop to discuss individual specifications. Although Joe Manton is the best known of the early London gun makers, there were other top-quality makers, and customers can choose a gun based on virtually any flintlock double of the period. "My customers like to shoot or hunt with them," he says." As far as I know, only one of my guns has been sold to a collector who doesn't shoot it."

The making of a flintlock starts with the guts of the gun: two flintlocks, one for each barrel. Using templates as his guides, Ehinger power saws the rough outline of parts from bar stock. "From then on, its just a matter of filing away," he says. While a modern double-barreled shotgun has a clean exterior sideplate, the flintlock's intricate cock, frizzen, frizzen spring, flash shield, frizzen bridle and charge pan require meticulous filing, rounding, fitting and shaping by hand. The same labor is applied to the interior lock parts and springs.

Upon completion, the interior lock parts are case hardened and polished to ensure durability and smooth functioning. Completing the pair, he estimates, takes over 300 hours of meticulous, fine-detail work.

Next comes barrel construction, which is

***Exceptionally fine grades*** *of walnut, superb engraving and faultless metal-to-wood fitting are hallmarks of any best-quality gun. Ehinger's own fowling piece (top) is stocked with black walnut, while a customer's gun has been stocked with a splendid piece of European (English) walnut. The distinctive pineapple-shaped finial at the tip of the trigger guard plate is a stylistic convention characteristic of early 19th-century English sporting guns.*

Ehinger's biggest concession to modernity. He turns down each barrel from modern steel barrel blanks, dispensing altogether with the Damascus steel that would have been found on an original period gun. In simplest terms, Damascus barrels were created by twisting, welding and hammering alternating bands of steel and iron around a central mandrel or core. The now-outdated process produced exceptionally beautiful barrels that showcased the complex designs created by the strips of twisted metal. They are not, however, generally as strong modern steel barrels.

"There are some barrel makers in Belgium and Germany still making Damascus barrels for the gun trade, but I'd be a little afraid of using them," he explains. "The problem is, you never know how much powder or what type of powder someone is going to put in a gun like this regardless of what you tell them. With Damascus, the barrels could explode with an improperly loaded gun."

Modern steel allows use of black powder in far heavier charges than what might be safe with Damascus. "Remember, I'm building these guns to shoot. In today's society, about the only way you can defend yourself against litigation is to use the absolute best modern steel out there," he adds. "And that's what I do."

After the barrels are turned down, they are silver soldered together near the breech. Then, upper and lower ribs are cut and filed, and the barrels and ribs are joined by lead solder, just as they would have been in 18th-century London. A heavy breech plug is turned, then screwed into the breech of both barrels, and hand-filed to shape. Finally, ramrod pipes are made and soldered on. The

resulting barrels can be easily detached from the action, just as with a modern break-action shotgun, only the breech is always plugged and the barrels do not swivel on any pinion. The barrels are simply lifted out vertically, allowing the gun to be broken down and placed in a case for ease of transport. The barrels are usually 28 or 30 inches long—short enough to be handy afield, long enough for a fluid swing.

The last major metalwork involves making the buttplate, the double triggers, the trigger guard, and two finials, which are the distinctive, pineapple-shaped, decorative metal inlets that form the tip of the trigger plate and the ramrod entry pipe at tip of the fore end. Again, all parts are made from hand and filed to shape.

After finishing the metal components, Ehinger begins stocking the gun. Fine walnut can breathe character into a gun featuring pedestrian metalwork; on the other hand, mediocre walnut can deflate even the best artistic aspirations. Ehinger stocks his guns with high grade European (English) walnut, either from blanks supplied by the customer or from blanks he keeps on hand.

His personal gun, by contrast, is specially stocked with piece of black walnut grown in North Carolina. "I dug up a stump down in Vander," he said. "It's about as pretty a piece of black walnut as you'll find." Although stock makers unanimously prefer English walnut, his gun's stock is a gorgeous coffee-bean brown streaked with toffee-colored whorls of lighter tan.

When Ehinger first begins fitting metal to wood, the walnut blank is only a rectangular approximation of gunstock shape. Once fitted up, he begins shaping out the stock. Most of the old London guns have stock dimensions identical to a modern English double gun, although the wrist on Manton-era stocks seems a bit fatter than those found on contemporary English guns. The stock is checkered with the large flat squares characteristic of the time and is shaped to the customer's measurements. Then Ehinger finishes it in a traditional hand-rubbed oil finish, in itself another time-consuming process.

Wood to metal fit is another litmus test of a truly best gun; it is here that the gun maker's discerning eye and steady hand become critical. Not only is proper fitting aesthetically pleasing, it is also functionally important. An ill-fitted stock is more prone to split or crack over time as recoil from continuous firing drives the metalwork into the wood. While I didn't look over Ehinger's gun with a magnifying glass, my impression was that a speck of dust would have a difficult time finding a seam to fall into. Flawless.

By now completely stocked and fitted out, the gun remains "in the white"—that is, the barrels are still not blacked nor has the exterior lockwork and metal been case-hardened. The gun then leaves the shop for the only time in the building process; sent to master engraver Lynton McKenzie in Tucson, an Australian who worked in the London gun trade engraving shotguns for James Purdey & Sons, among others. "My engraving is equal or better to that of the flintlock period," Ehinger says, "but it's not good enough for today's tastes. When someone spends a lot of money on one of these guns they expect exceptionally high-grade engraving."

***Ehinger's tools** of the trade are files, and lots of them. Aside from machine boring the barrels, virtually all the metalwork is hand shaped by filing.*

In contrast to the gaudy scribbles found on Continental European guns of the 1790s, engraving on London guns was always—to use a British term—restrained. "Ornamentation was reduced to a minimum and even when the weapons were silver, emphasis was placed on graceful lines and well-judged proportions," writes Geoffrey Boothroyd, one of Britain's premier gun writers. "Decoration by the end of the (18th) century had been subordinated to mechanical perfection."

When the engraving is finished, McKenzie returns the gun to Ehinger for finishing touches. In traditional London style, he blacks (blues) his barrels with a deep coal-colored luster, or browns them so the color resembles a Damascus barrel. For browning or blacking, he uses the time-honored slow rust process. Color-casehardening is also traditionally accomplished by baking the metal parts in an animal bone meal charcoal to impart not only hardening to the metal, but also to imbue it with the alluring hues of blue, gold and gray inherent in such finishes.

The metal is refitted to the stock, perhaps a bit of final polishing done to the interior locks, and the gun is finished. In the hand, an Ehinger 12-bore will weigh about 7¾ pounds, depending on the density of the wood; a 20-bore, about 7 pounds even. If you want the traditional wool-lined case fitted out with period accessories, Michael will make one from mahogany with brass fittings.

Then the gun is yours—for a little over $20,000. A couple grand extra if you want a case.

While you're prying your chin off the floor, think about this: 1,000 hours divided into $20,000 comes out to about $20 per hour, a good deal less than what you probably pay your neighborhood plumber by the hour. It's also considerably less than the $40,000 to $60,000 needed to commission a modern "bespoke" double from a London gunhouse today—firearms that also take about 1,000 hours to complete. By these measures, Ehinger's work is a bargain.

While most of us, including me, will never carry such firearms afield, I don't buy the argument that guns like this are just another exercise in feckless spending for the obscenely wealthy. For perfection in a hunting weapon touches a chord very deep and powerful within the psyche of Man. You can see it manifested in the flawless Folsom points made by Paleo-Indians up through weapons of the ages to the custom hunting shotguns and rifles of today.

Michael Ehinger's guns belong to the 18th century, but the purity of their form is timeless. ☒

North America
South America

KEN TAYLOR

# COLUMBUS & THE BIRDS

With weeks to go before he made landfall, Christopher Columbus saw songbirds that gave him false hope. What were those tiny birds doing in the middle of the Atlantic?

written by David S. Lee ©1992
illustrated by Walt Obman ©1992

This year is the 500th anniversary of the European discovery of the New World. Celebrations and essays on Columbus' voyages have gotten lots of media attention. You may think you know enough about the *Nina*, the *Pinta* and the *Santa Maria*, but did you know that a major biological phenomenon, one not fully understood until the late 1970s, influenced the discovery and colonization of the New World?

For Christopher Columbus, the captain of a lost fleet of ships, the empty horizon of the North Atlantic must have been an exceptionally lonely place. To add to his problems, he had to answer to a discontented crew. Columbus recorded in his log that the appearance of songbirds restored hope, and to some extent harmony, to his near mutinous crew of 87 men. The date was September 20, 1492. After sighting the birds, the men on board the three ships sailed onward

STEVE MASLOWSKI

STEVE MASLOWSKI

***Despite its small size,*** *the common yellowthroat (top) is an ocean migrant in fall. Some yellowthroats migrate to South America, but others fly shorter distances to South Carolina and other southern states. Ospreys (above), peregrine falcons and other raptors also take the ocean route south, with peregrines feeding on exhausted birds while migrating.*

with renewed confidence.

The birds are a great part of the story that many may remember from grade school history. Omitted from the version I was taught was the fact that the birds were sighted 22 days before sighting land, placing them in the middle of the Sargasso Sea. Columbus reported seeing ducks, doves, and "singing birds" that had no reason to be there. Yet, his log also mentions more land bird sightings on subsequent days. For years, natural history scholars have puzzled over Columbus's log entries. Some flatly announced that Columbus erred in his statements. His crew was so irritated, they said, that Columbus was forced to keep two logs, one for his personal calculations and one to appease his men.

Were the bird entries simply a ploy to quiet the crew? The answer is no, but it was not until well into this century that ornithologists knew why. It was only then that they began to document the magnitude of oceanic migrations of North American land birds.

Most birds follow four well-known migratory routes from their summer nesting ground to their wintering grounds in the South. Some of these flyways follow major geographical features, such as the Missisippi River and the Atlantic coast. The route south over the open Atlantic, thus, seems risky and even foolhardy.

The annual fall saga starts sometime in early August, peaks in October and continues through November. Millions of songbirds completing their summer nesting duties move toward the coast, triggered by shortening day lengths. Fifty to 100 miles inland they stop and wait, sometimes for days, constantly feeding to keep up fat reserves. When cold fronts pass through, the birds leave, trailing the front. Gaining altitude, they fly out to sea, a strange behavior for ¾- to 1¼-ounce birds.

The evidence for an Atlantic migration route is now rather extensive, yet it was well into the 1970s before the cumulative body of information was put into perspective. In the past, common sense led to two assumptions. One was that the birds making such a journey must perish; such confused migratory instincts were not typical. Or the birds swung southwest and made landfall farther down the coast, a shorter trip.

I have talked with North Carolina charter boat captains who regularly fish the Gulf Stream. They tell stories of small exhausted birds that land on their boats in the fall. Many refer to them as canaries, but captains more familiar with birds have reported rails, ospreys, eagles, teal, doves, shorebirds and herons—all far offshore. On one offshore trip, accompanied by several enthusiastic bird watchers all hoping to add rare sea birds to

their life list, one lady squealed, "Oh my, what is that?" The captain leaned over from the upper deck and loudly responded, "Ma'am, back on land we call 'em swallows."

Early one October as we plied the Stream, a male yellowthroat landed on our boat. The bird was exhausted and easily captured by hand. We put the bird in a paper bag assuming this would quiet it and allow it to regain strength. Early in the afternoon the captain announced, "Oi've caught him a fly." The yellowthroat devoured it with enthusiasm. Late in the day, as we were coming back through the inlet, we released the bird. Land was less that 200 yards off our starboard and I was curious to see the direction it would take. The bird launched itself from my hand, but before it had flown more than 10 yards from the boat, it was swallowed by a laughing gull.

Gulls must consume a large portion of the weakened birds that are unable to maintain speed and altitude. The individuals that land, or try to land, on ships at sea must represent a very small fraction of the annual casualties. Some of them cannot even catch up with charter boats at trolling speed, and I have seen weary birds fly through the crest of waves presumably too weak to avoid them.

During the 1977 fall migration, researchers from Woods Hole Oceanographic Institution stationed a radar unit aboard a ship southeast of Bermuda in the Sargasso Sea. They were 1,000 miles from mainland North America. Expecting to intercept vast legions of birds, they were not disappointed. Birds flying at altitudes of a few hundred feet to ones at the upper limit of radar detection, one-and-a-half miles overhead were detected. At the same time radar units on Antigua picked up high-flying birds coming from the Sargasso Sea and heading for the South American coast. The last link of the journey was confirmed. The open Atlantic was indeed an important fall migration route for North American songbirds.

A network of stations using narrow-beam radar was established in an attempt to better understand the nature of the migration. The birds show up on radar as small, slowly moving dots. The radar showed that the birds departed at night and only when winds were favorable for the preferred direction of migration.

JIM PARNELL

***Shorebirds such as** the Eastern willet are among the first to migrate via the ocean route. After building up large amounts of fat, these birds generally begin their long journey to South America in August. In September the warblers and other neotropical migrants begin their migrations. Last are birds such as sparrows and cedar waxwings that fly shorter distances to winter in Florida.*

# Ocean Sightings of Land-based Birds

Although individual sightings of land-based birds at sea suggest that they use an ocean route for migrating, not much is known about the relative abundance of each species. The following 97 species have been recorded from the offshore waters of North Carolina and South Carolina.

*Podicipediformes*
- Pied-billed grebe

*Pelecaniformes*
- Brown pelican
- Double-crested cormorant

*Ciconiiformes*
- Great blue heron
- Snowy egret
- Little blue heron
- Cattle egret

*Anseriformes*
- Northern pintail
- Blue-winged teal
- Lesser scaup
- White-winged scoter
- Red-breasted merganser

*Falconiformes*
- Osprey
- Northern harrier
- Sharp-shinned hawk
- American kestrel
- Merlin
- Peregrine falcon

*Gruiformes*
- Clapper rail
- King rail
- Purple gallinule
- American coot

*Charadriiformes*
- Black-bellied plover
- Lesser golden-plover
- Semipalmated plover
- Greater yellowlegs
- Solitary sandpiper
- Willet
- Spotted sandpiper
- Whimbrel
- Ruddy turnstone
- Red knot
- Sanderling
- Semipalmated sandpiper
- Least sandpiper
- Stilt sandpiper
- Short-billed dowitcher

*Columbiformes*
- Mourning dove

*Apodiformes*
- Chimney swift

*Coraciiformes*
- Belted kingfisher

*Piciformes*
- Red-headed woodpecker
- Downy woodpecker
- Northern flicker

*Passeriformes*
- Acadian flycatcher
- Least flycatcher
- "Tropical" kingbird
- Tree swallow
- Bank swallow
- Cliff swallow
- Barn swallow
- American crow
- Red-breasted nuthatch
- Brown creeper
- House wren
- Golden-crowned kinglet
- Ruby-crowned kinglet
- Gray catbird
- Cedar waxwing
- European starling
- Orange-crowned warbler
- Nashville warbler
- Yellow warbler
- Cape May warbler
- Black-throated blue warbler
- Yellow-rumped warbler
- Black-throated green warbler
- Yellow-throated warbler
- Prairie warbler
- Palm warbler
- Bay-breasted warbler
- Blackpoll warbler
- Black-and-white warbler
- American redstart
- Prothonotary warbler
- Northern waterthrush
- Kentucky warbler
- Mourning warbler
- Common yellowthroat
- Yellow-breasted chat
- Indigo bunting
- Dickcissel
- Rufous-sided towhee
- Chipping sparrow
- Tree sparrow
- Field sparrow
- Savannah sparrow
- Song sparrow
- Swamp sparrow
- White-throated sparrow
- White-crowned sparrow
- Dark-eyed junco
- Lapland longspur
- Bobolink
- Eastern meadowlark
- Boat-tailed grackle
- Orchard oriole
- Northern oriole

The birds did not depart from specific points but formed a broad front all along the coast.

Observers at Cape Cod were fascinated by the numbers of birds moving into the Atlantic in the early hours of darkness. They established that just from the Cape, up to 12 million departed on some nights. There was much variation in direction, speed, altitude and size of the migrant clouds of birds. Most of the migrants flew below an altitude of a mile. They flew at air speeds of 19 to 38 miles per hour, but with favorable winds a few groups were clocked at speeds of over 60 miles per hour.

The radar dots did not pay any attention to Bermuda or the Caribbean islands as they blipped across the monitoring screen. Somewhere over the Sargasso Sea the birds changed direction and their flight shifted to the west ensuring landfall on the northern South American coast.

Migrants use favorable weather conditions to initiate their flights over the Atlantic. Over land the bulk of migration takes place at night. Cold fronts that trigger departure rarely penetrate far into the Atlantic and they usually become stationary 300 to 600 miles offshore. The birds eventually overtake the front and fly through it. Why the birds fly at such high altitudes, where oxygen is about half what it is at sea level, is open to speculation, but radar information from Antigua, at least, showed more favorable winds to be present higher up.

Small birds increase normal fat deposits with the pre-migratory reserve representing 35 percent to 40 percent of the bird's total weight. For some species it is as high as 50 percent. To show the effectiveness of fat as fuel, Timothy and Janet Williams, two researchers involved with open-ocean migration studies of land birds, calculated that a warbler burning gasoline with the same efficiency as fat would travel 720,000 miles on a gallon. Their fat is high octane, I suppose. Based on their fat weight loss, blackpoll warblers can fly an estimated 95 hours or more. Their flight range without wind has been calculated by calorie consumptions to be 2,153 miles. Flying at 30 miles per hour, these warblers have to fly for three days straight. They are perfectly capable of completing the trip but the margin for error is small.

While the occurrence of fall migrants landing on vessels is common enough, only rarely have the details of the event been recorded. The documentation of the migration route is now well-established, but the species composition of the migrant clouds detected on radar screens remains unknown. Radar could often identify passerines (songbirds) from non-passerines, but otherwise the species remained anonymous. During

STEVE MASLOWSKI

STEVE MASLOWSKI

***Blackpoll warblers** (above) and black and white warblers (left) are among the long-distance neotropical migrants that take the ocean route to South America or the Caribbean. These diminutive birds are often so exhausted they land on boats at sea to rest. So small are these birds that no one knows what percentage of them actually complete the trip. The mortality rate may be high.*

the course of my 15 years of studying sea birds in the Gulf Stream off Cape Hatteras, I kept records of the land-based birds seen at sea. The cumulative records provide some insight into the specifics of the Atlantic migration: I've recorded nearly a hundred different species!

The risk involved in such a lengthy journey, especially for small birds, seems obvious to us. And exhaustion isn't the only threat to safe passage. In addition to the obvious hazardous potential from strong Atlantic weather systems, migration coincides with the late summer and early fall hurricane season. Furthermore, for migrating passerines, the Bermuda Triangle must have taken its toll. In fact the reputation of the Bermuda Triangle may, in part, be attributed to the millions of migrating birds passing through it. John Teal, one of the pioneers in the use of radar for bird tracking, correctly points out that several of the small naval planes that disappeared without a trace were ones that could have sustained damage from striking unexpected fall migrants. The impact of a great blue heron on a plane moving 200 miles per hour, a mile-and-a-half above the Atlantic, could explode the windshield.

For the birds, however, the problems are not as dramatic as one might suppose. Fall weather systems are surprisingly predictable. By waiting for cold fronts to move to sea, the birds can depend on a favorable northwest wind during the early part of their flight. A front is also a good indication of fair weather from the coast to at least the Sargasso Sea. Hurricanes approaching the Atlantic coast will usually stall the southeast movement of cold fronts. Once over the Sargasso Sea, there is little concern for navigational calculations. If the birds continue to fly to the southeast, the trade winds will correct the track and carry them to their destination. It has been established that over 100 million birds undertake this journey each fall. The majority are successful.

For Columbus, the westward course across the Atlantic was not self-correcting. After leaving the Canary Islands on his first voyage, Columbus and his crew were out of sight of land for 35 days. Following his instincts, he simply sailed into the wake of the setting sun. In the late 1400s it was unknown that a compass points slightly differently at different places, and the crew was in panic by the time they reached what was later to be known as the Bermuda Triangle. Mats of floating sargassum added yet another unfamiliar and eerie element to their fears.

The arrival of the land birds and the direction of their flight caused Columbus to adjust his course slightly to the south. What effect this had on the history of the New World can only be surmised. The original course would have delivered his ships to the mercy of the Gulf Stream and, depending on the wind, the stream may have moved him far north of his historic destination in the Bahamas. Perhaps he would have discovered the Carolinas. Wilmington could have been the hub of the Spanish conquest. The ramifications of this might have affected every aspect of the 500 years of European presence in the New World. I might be writing this in Spanish and Mexicans might speak French. Our entire history may have been built around a few exhausted songbirds from Vermont. ⬡

# COME CELEBRATE THE LAND

The Nature Conservancy in North Carolina passes its 15th year as a steward of priceless habitats, and the roll call of places saved is little short of astonishing.

written by Lawrence S. Earley

KEN TAYLOR

ROANOKE RIVER

Swap a piece of valuable swampland for a condo? It seemed an improbable offer coming from a conservation organization, yet that was the deal the North Carolina Chapter of The Nature Conservancy put on the table in 1988.

The family owners of Devil's Gut, a deeply wooded swamp on the Roanoke River near Jamesville in Martin County, wanted to sell their land to buy a condominium in Florida. So The Nature Conservancy, which badly wanted the swampland for its Roanoke River project, took the hint and went shopping. The swap took place not long after—the house for one of the conservancy's top natural-areas priorities on the Roanoke.

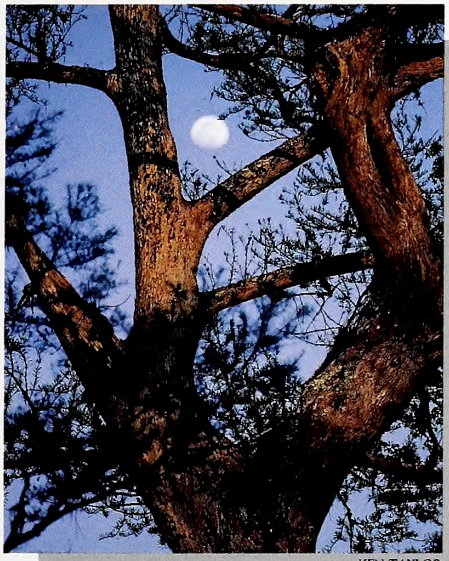
The Devil's Gut transaction marks perhaps only the zaniest of the Nature Conservancy's deals for nature, hardly the only one. Indeed, in its short existence in North Carolina this non-profit membership organization has helped place 337,496 acres of land under permament protection. So effective has the 15,947-member state chapter been that one out of every 19 acres protected nationwide by The Nature Conservancy has been in North Carolina. Each of its projects represents a slice of the state's vast biological diversity, from the maritime forest of Nags Head Woods on the Dare County coast to the unique wetland fen of Bluff Mountain in Ashe County, 121 projects in all.

This year the North Carolina Chapter of The Nature Conservancy is celebrating its 15th anniversary of protecting valuable natural areas in the state, and North Carolinians have good reason to offer them a toast of thanks and best wishes.

The Conservancy protects land in a variety of ways. Some it buys to manage for research, education or recreation, as it did with Bluff Mountain in 1978 or Nags Head Woods in the same year. Yet, of the more than 300,000 acres it has protected, only 32,523 represent conservancy-owned preserves. More often it resells the land it buys to a public agency, as it did with Panthertown Valley in 1989 which it bought from Duke Power Company and then resold to the U.S. Forest Service. It has also secured lands through donations, as when Union Camp Corporation in 1982 donated Camassia Slopes, a spectacular natural area on the Roanoke containing rare plants more at home in Ohio.

Most often The Nature Conservancy protects land through conservation easements, leases and voluntary management agreements that leave land in the hands of the owners. The group's small staff has gotten a reputation for being able to negotiate in any context, whether it's knocking heads in a corporate boardroom or settin' and rockin' a spell on a backwoods front porch. Some of its deals—like Devil's Gut—have become legendary.

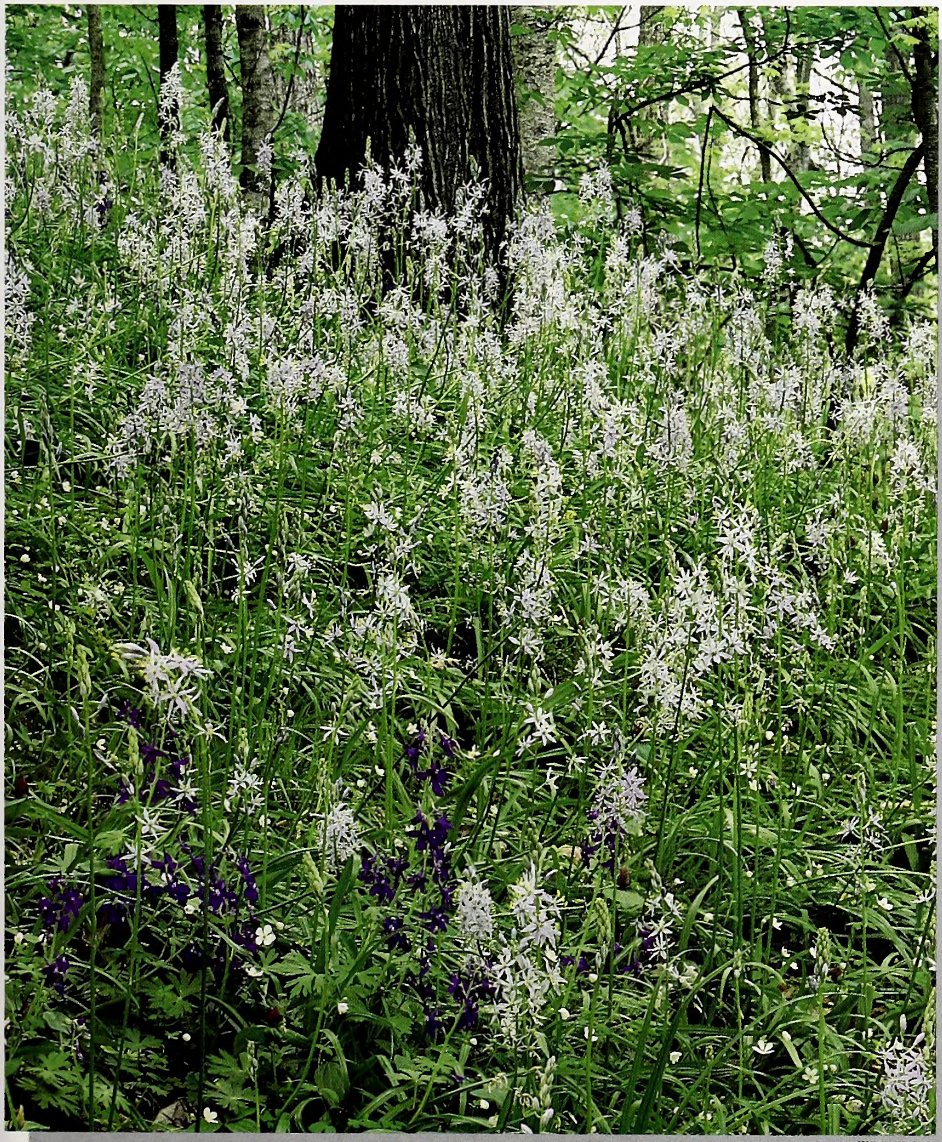
We can only share with you some of the highlights of The Nature Conservancy's extraordinary 15-year resume in the state. But we invite you to find out more about its conservation work by writing The Nature Conservancy/North Carolina Chapter, Carr Mill Mall, Suite D12, Carrboro, NC 27510.



KEN TAYLOR

## Black River
*(Baldcypress tree)*

## Roanoke River
*(Camassia Slopes)*



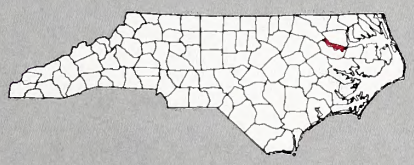
JEFF LEPORE

***Roanoke River***

The forested lands flanking the river have been a major protection priority of the North Carolina Chapter of The Nature Conservancy since it began 15 years ago. And for good reason. Flanking the Roanoke River is one of the last of the great southern bottomland hardwood forests, what some have called "the largest intact, and least disturbed, bottomland forest ecosystem remaining in the mid-Atlantic region."

The Roanoke bottomlands are among the most diverse in the state, featuring not only vast baldcypress and tupelo gum swamps, but bluffs where rare plant species are found. Hunters and fishermen know the Roanoke River and its bottomlands from the legendary populations of deer, wild turkey and striped bass. Birdwatchers know it from the 214 bird species found there, the highest diversity in the Coastal Plain. Botanists know it from places like Camassia Slopes where rare plants more at home in the Midwest grow.

Since the Roanoke River Wildlife Refuge was created in 1990, the Conservancy has helped protect over 26,000 acres of these forested lands.



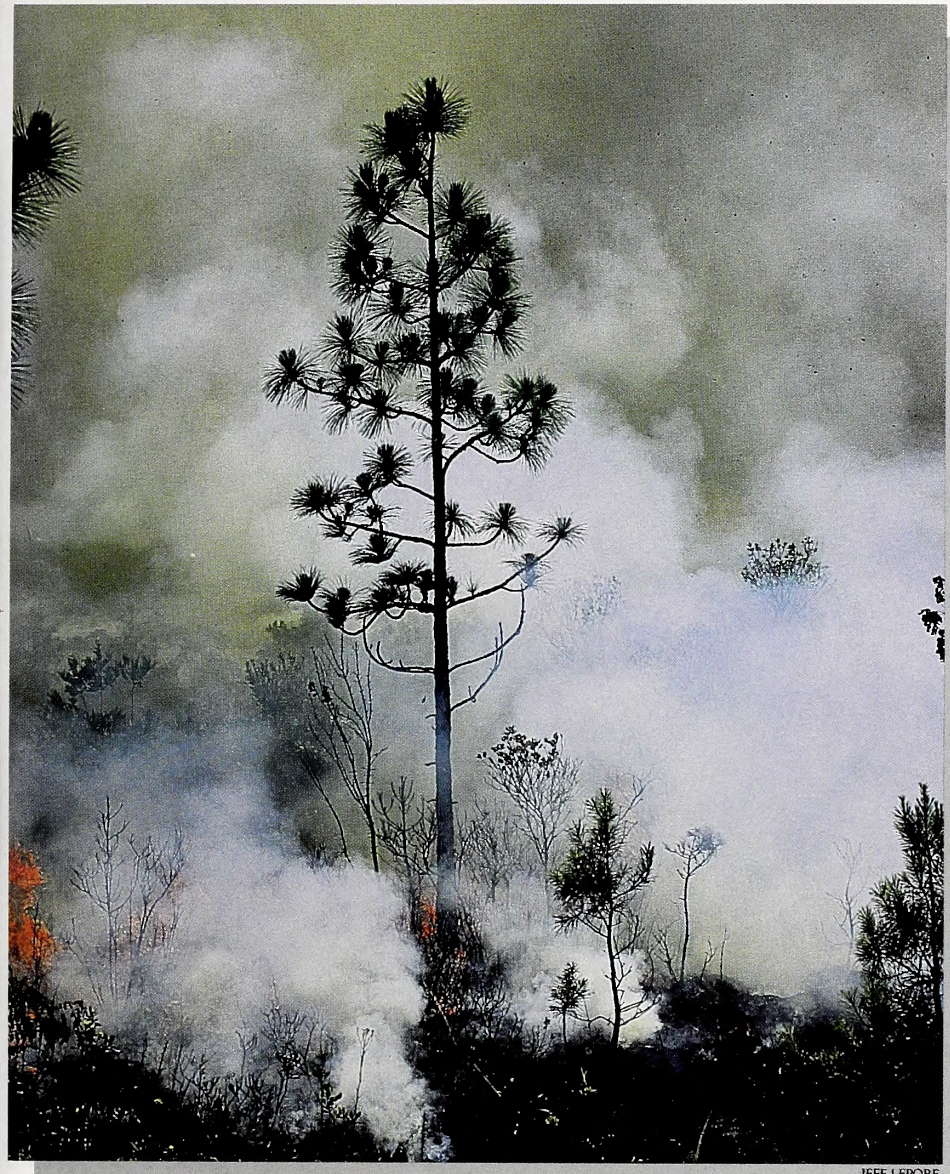
***Black River***

Ancient baldcypress trees flank this blackwater river that flows through Bladen and Pender counties. Scientists have found cypress that are almost 1,700 years old, the oldest trees east of the Rocky Mountains. Tree-ring analysis of these old trees may help in the understanding of regional climate patterns.

The Nature Conservancy wants to create a 2,600-acre natural area around the old trees, mainly through conservation easements and other voluntary agreements. To date, 964 acres have been protected.

KEN TAYLOR

# Bluff Mountain



JEFF LEPORE

## GREEN SWAMP
*(Longleaf pine tree)*

KEN TAYLOR

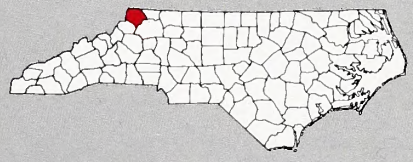
## BLUFF MOUNTAIN
*(Indian paintbrush)*

***Bluff Mountain***

Long known among botanists for its fantastic floral display both in spring and fall, the Bluff Mountain preserve is an unusual meeting ground between coastal and mountain plant species and northern and southern species. More than 400 wildflowers and shrubs have been documented from this 834-acre Ashe County plot.

The mountain is also a mosaic of natural areas, including cliff outcroppings where such endangered species as the cliff avens grows and the only known occurrence of a southern Appalachian fen. This rare mountain wetland is the habitat of a population of bog turtles.

The Conservancy purchased Bluff Mountain from the Wyn Edwards and Mac Edwards families in 1978.

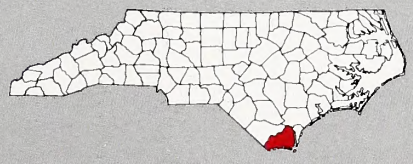


***Green Swamp***

Though known for its fire-dependent longleaf pine savannas, the Green Swamp in Columbus County also has extensive pocosins and forests of Atlantic white cedar (juniper).

The savannas also host a legendary assortment of plants; botanists have found 50 different species within a 10-foot square.

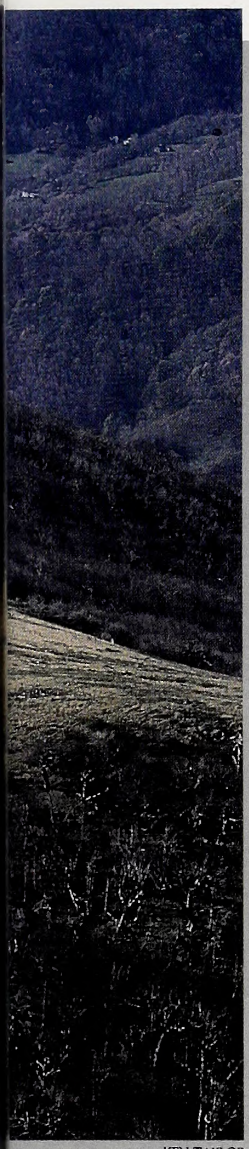
In 1977 and in 1986, Federal Paperboard Inc. donated a total of 15,722 acres of the Green Swamp to the Nature Conservancy.



JEFF LEPORE

## Pitcher Plant Bog

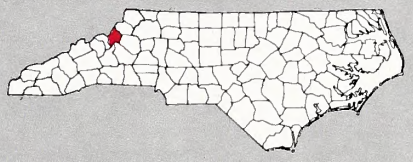
*(Sweet pitcher plant)*



KEN TAYLOR

## Big Yellow Mountain

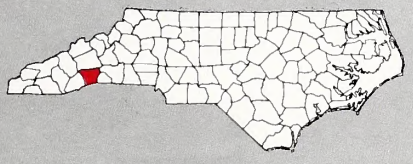
This 426-acre Avery County preserve is distinguished by its floral beauty and the scenic attraction of its balds. These open, grassy areas atop mountains throughout the southern Appalachians have intrigued scientists and enchanted hikers for years. While no one has adequately explained how the balds were formed, hiking them is a rare pleasure in the largely forested region.



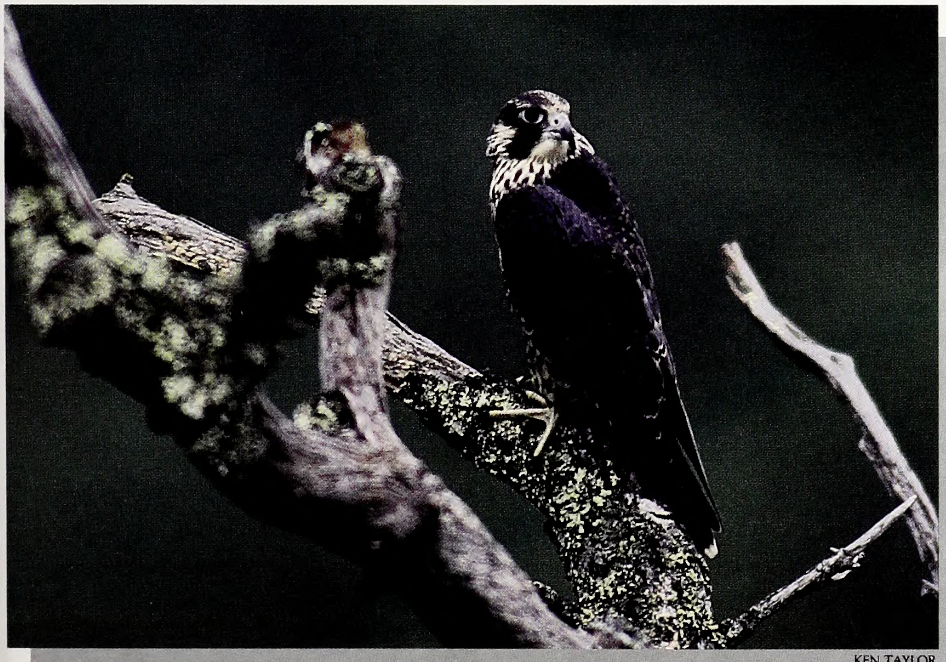
## Pitcher Plant Bog

Mountain bogs are among the rarest and most fragile wetlands in the state. Estimates are that only 500 acres of bogs remain in the southern Appalachians. Most bogs are only a few acres wide.

Bogs form when more water enters an area than leaves. The wet conditions favor a host of wildflowers, many of them rare and endangered. The sweet mountain pitcher plant, for example, is known from only four locations in North Carolina. The Conservancy bought Pitcher Plant Bog in 1992.



## Grandfather Mountain
*(Peregrine falcon)*

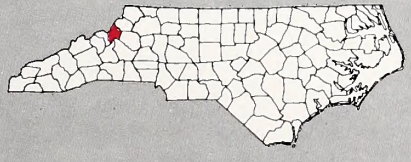


KEN TAYLOR

## Grandfather Mountain

Few of the hundreds of hikers that clamber over Grandfather Mountain's many trails realize that it is habitat for more globally rare species than any other mountain east of the Rocky Mountains. Its landscape of rocky outcrops and forested slopes harbors such endangered and threatened species as the peregrine falcon, the northern flying squirrel, Heller's blazing star, mountain bluet and the Blue Ridge goldenrod federally listed plant species found there.

In 1991, Grandfather Mountain, Inc. and the Wilmor Corp. began donating a series of conservation easements to the Conservancy which will eventually protect 2,200 acres of the mountain.



# The Jubilation Buck

"He emerged in the periphery of my vision like a specter resurrected from a hundred armchair dreams. Gray and vaunted he came, with high, heavy beams and long, polished tines."

written by Mike Gaddis © 1992
illustrated by David Williams © 1992

I knew immediately they were deer!

The rhythm of their travel was telling, similar to that of a human, but a bit lighter, a bit more careful and calculated. There were two, one leading, one trailing. They were walking at ease and closing.

The thing I didn't know was where they were. The hearing in my right ear is dulled, a good argument for protection against years of magnum shotshells and heavy rifles. It's difficult to discern the distance or direction of the sound. In compensation, I have to remain immobile

until I actually have a deer in sight, a major disadvantage for a bowhunter.

So I was sitting when I wanted to be standing, with my bow across my lap. By the time I was able to hear that they were behind and left, I already had the lead deer, a doe, in the corner of my eye. She was walking quietly, alert, but with no sign of alarm. It must stay that way. She was the front guard, and no doubt good at it. The deer behind had stopped, waiting for the okay. That was the one that drew my interest. The doe passed at 15 yards, undisturbed. So far, the advantage remained mine. But, somehow, I had to get up. No hope now. The trailing deer was moving again, on the path of its companion, very slowly and deliberately. There was a deep pounding in my chest!

The big sign had erupted in *his* territory 10 days ago. A 6-inch cedar, violently rubbed, gored and mutilated well into its lower limbs, and several wrung-off hardwood saplings punctuated an early scrapeline that traversed the neck of pine woods between a big cut-over and a massive creek-bottom thicket. This was the signature of a good buck and I had recognized it immediately. I had hunted him unsuccessfully for the past two seasons. He had proven a formidable adversary. I admired him greatly.

Two full days and two sleepless nights had gone into my setup. Three more days had allowed any scent of mine to cool. Now, a deer was moving toward me and the paths of our lives would cross. Would it be *him*? A few more seconds, a mere eternity, and I would know.

He emerged in the periphery of my vision like a specter resurrected from a hundred armchair dreams! Gray and vaunted he came, under high, heavy beams and long, polished tines. He traveled with an air of superiority, even arrogance, and the kinetic energy of it left me fighting for control.

Alongside now, he stopped and lifted his head. Though I was riveted to the tree, he sensed my presence. Breathing deeply and slowly, avoiding eye contact, I concentrated on absolute immobility. Even so, I had the feeling he was reading every rise and fall of my chest. He grew jittery and threatened to bolt. I held my breath. Instead, he shook his head defiantly, took a few jaunty bounces on stiff legs, and stopped again to look at me. I had not moved and he seemed satisfied. Dropping his head once more, he continued on the track of the waiting doe.

A few steps more and he would pass behind a small cedar and a few sparse maple saplings. That would be my only chance. It would have to be quick and smooth. When the leaf screen was between us, I eased up and drew my bow in one motion. Thirty yards out, he had stopped with his nose to the ground. The distance was greater than I would have liked, but it was open and the shot was there. The sight pin rested steadily behind his shoulder and I talked myself through a smooth release and follow through.

The stout *whu-m-m-pf* of the bow broke the silence and the overdrawn shaft blazed toward its destination. The buck took a wild, bucking sideways leap and tore out with the doe for the creek-bottom thicket.

Suddenly, a wave of hot nausea rushed through me and I was dangerously light-headed. I was shaking and sweating profusely, and my heart thumped madly. The ground below was rotating like the deck of a carousel. I managed to drop to the seat of the stand and brace myself against the tree, panting for several minutes like a dog overcome with heat distress. The switchboard overload in my brain kept flashing the message that I had just had an encounter with a tremendous whitetail.

I waited 20 minutes before I climbed down. That's cutting it short, but I couldn't stand it any longer. I felt I had a good hit on the buck and that he would not travel far.

I began searching for my arrow and the sign of a hit where he was standing when I shot. Nothing. The first 20 yards in the direction of his flight was also unproductive. By the time I had worked out 50 yards without a trace of the arrow or the first drop of blood, I was getting

*"I had not taken a wild, unreasonable shot. I had practiced it many times. What had gone awry, I could not say."*

worried. A bit frantically now, I started a wide, quartering pattern that would intersect his line of retreat. Almost 80 yards out, I found what I was looking for—large splotches of dark red blood leading toward the creek-bottom thicket. It was heavy, on the ground and on the undergrowth where he had passed. I expected to find him down in the next 50 yards.

But the blood trail grew thin, dwindling to only a drop here and there. Entering the thicket, I had to look hard for occasional signs at 8- to 12-foot intervals. Finally, I was inching along on hands and knees, intensely studying the ground to distinguish the small specks of blood from the measled pigmentation of the freshly fallen gum leaves.

My confidence was shaken. The sign read more as deeply wounded muscle tissue than a vital hit. It was growing hard to understand.

My troubles were compounded by the fading light. It was already deep dusk and I had lost the trail altogether. Forty yards on, proceeding on instinct, I found one small red smear on a pine needle. A moment later, I heard him get up, only a few feet ahead! I stopped and listened closely. The night was eerily still and the tortured limbs of the second growth were like gnarled, grasping fingers against the blackened sky. He was moving slowly away. For several spellbinding minutes I could hear him picking his way through the dense thicket. Then he was gone. Somewhere down the creek bottom, a big owl hooted . . . once . . . twice. I felt the boy rise in the man.

In the slight depression where the buck had bedded, there were only a few drops of blood. It was obvious now that he was not hit as well as I had hoped. I suspected a deep shoulder wound because there had been no paunch sign. I felt terrible, depressed with the lingering pain I had inflicted on a creature I respected deeply. I had not taken a wild, unreasonable shot. I had practiced it many times. What had gone awry, I could not say.

Should I follow or hold off? His natural reaction would be to lie down again. That might well be my best chance at getting him. If I kept following him, on a wound that might eventually be fatal but was not presently debilitating, he might push clean out of the area never to be found. As much as I hated to leave, that was the thing that seemed most feasible. Leave, and be back at first light.

Everything I had was camouflaged, but I hung an old poncho in a tree with the intention of marking my place, and backtracked out of the thicket. I left a drink can at its edge. I made a mental note to keep some blaze-orange survey flagging in my pack. Then, reluctantly, I left and walked to the Scout in a quandary of depression and anticipation.

Reaching home, I called Teddy Roberts. He's a good man in the woods and I needed his help. When he recognized my voice, urgent in tone and an octave higher than usual, he knew it had to do with deer.

"Where is he?" he asked.

"He's nice! I mean real *nice*," I replied.

"How nice?" he demanded.

"A big eight, maybe a ten," I said. "The problem is, he's still in the woods." I told him the story.

"Lord!" he returned.

"If we find him, I don't think you'll be disappointed. Can you go with me in the morning?"

"I'm supposed to work. Let me see what I can do. If I can make it, I'll be over an hour before day."

"Thanks," I said, "I'm pretty shook up. I need somebody with a cool head."

For the present, all was done that could be done. Now came the long wait for morning. At 10 p.m., I turned in, resolved that I was doing the right thing and with the notion of getting at least a little rest.

I should have known better. The demons in my head beleaguered my troubled mind into another overload, ruling out any possibility of sleep. In the nocturnal woods, injured and vulnerable, was a bowhunting trophy I had pursued for years. I could think of a dozen things that could go wrong before dawn. And I was lying on my back doing nothing.

I charged out of bed for the telephone. "C'mon, Teddy, be there!" The "hello" was his.

"If that was your deer out there in the woods, what would *you* do?" I asked.

"I'd be there looking."

"Let's go," I declared.

I heard a door slam at the other end of the phone. My daughter picked up the conversation. "He's on his way," she said. No doubt about it. She had married the right man.

We made the thicket just after midnight. Three times I sent Teddy into the tangle, trying in vain to direct him to the poncho. Then I went in three times, with the same result.

"Damn!" I swore. "I'll never go in the woods again without some survey flagging." An hour had been wasted.

"All I know is to go back and try to pick it up where you first found blood," Teddy said. "That's about all we can do at this point," I agreed. "We're spinning wheels."

Ten minutes of casting around and I had the initial blood trail. It was less distinct now and mostly dry. On every drop was a hoard of ants. The smaller drops were being consumed rapidly. It took 45 minutes on our hands and knees to trace it back into the thicket to the poncho. We found the bed and 10 feet beyond, one small drop of blood. Then we hit a dead end. There was a wash ahead, shoulder deep, grown up with saplings. It led downhill, toward the creek. The bank on the other side would have been a good, uphill jump for the buck, and we doubted that he made it. But maybe. I took the wash and Teddy worked the far bank on into the thicket. Both of us were crawling at a snail's pace, the night pitch black beyond the small area illuminated by our lights.

The wash seemed the logical egress. It would have provided cover and declining elevation. But it proved barren to its end. The small, red ticking on the fallen gum leaves was like an endless vein of fool's gold. I finally gave up and joined Teddy, now 50 yards farther into the thicket. We looked laboriously for another 30 minutes, quartering on all fours. Nothing!

Teddy lay down on his back in the leaves. The night was beautiful, full of stars. I checked my watch . . . 2:25. We were tired, and lay there dozing, in and out, contemplating our dilemna. We had come pumped up with optimism, determined to find this deer. Determined we remained, but for the moment our hopes were taking a beating. We could not know that this was just the start. It would be a rollercoaster evening emotionally.

"I don't understand it," Teddy lamented. "By all rights, he should have taken that ditch to the creek. They usually go downhill. It's just hard to believe he jumped it, and anyhow, we've looked this side out good."

We lay on in silence for another five minutes. Then it hit us both at the same time!

We said it to each other, in unison. "He never crossed the ditch!"

"He went down the other side," Teddy said. "That's the only answer."

I was glad Teddy was there. He had good instincts for this, and my head was still swimming from a double shot of euphoria and anxiety.

We fell over each other batting through the thicket to reach the ditch again, and the last drop of blood we had left well over an hour before. Less than a minute later, we found another. Then, a few feet farther along the lip of the ditch, yet another. It gleamed ruby-red in the brilliant beam of Teddy's coon light. We whooped with delight. Back in business.

The trail was meager, but steady. At the lower end of the wash, it led east, deeper into the

*"Greater than the memory of that deer, grand as he was, would be the way it all felt—the fine, simple sense of mutual pride in being honest to the hunt..."*

thicket and ran parallel to the creek some 60 yards below. A small drop here, another there, located only with painstaking care. I had a roll of toilet paper and everywhere we found a drop of blood, I placed a piece of tissue. When you looked back, you couldn't see the faint blood trail, but you could easily see the line of paper and a general direction of travel. After a quarter-mile, the buck had horseshoed, backtracking.

Then, once again, everything dried up. We searched and searched, me on the thicket hillside, Teddy along the creek where we felt he had gone. We joined ranks 30 minutes later, downtrodden again, sinking to our knees in exhaustion.

"Lord," Teddy said. He had taken to praying for the second time that night. "I got to tell you. I came with you thinking we could do it. But I'm gettin' concerned. There's just no blood."

I didn't respond. I just felt sick inside. We lay down again, and this time must have slept for a half-hour. As I woke up, Teddy was getting to his feet.

"I'm going back down along the creek and look some more. I still believe he crossed somewhere," he declared. There was no quit in the boy. I liked that. Picking up on the hillside again, I searched farther east. Maybe he looped again. But it took me nowhere. I was suffering another twinge of despair when I heard Teddy yell!

"I've got blood," he hollered wildly.

Mindless of the stinging branches and clawing catbrier, I fought my way toward his voice. He was standing alongside the creek at a deer crossing 80 yards from our departure point. With his hand, he pulled aside the overhanging cover along the creek bank and directed his light to one small green leaf at the edge of the water. On it was one pea-sized drop of blood.

"Boy... you're good," I said.

"Lucky," Teddy replied. "I just kept working the creek bank back and forth, and finally found it." Chalk one up to grit, I was thinking.

We crossed the creek, and began looking anew, hopes cautiously renewed. There were several beaver ponds in the area and together with the long creek bottoms stretching to the east and west, another lesser swale bordering a tributary branch leading south. I worked away west, Teddy east. We met a long while later. Not a thing, either way. Together, we searched a good ways up to the swale. Zero! Despondently, we made our way back to the creek crossing. It was the lowest point of the night.

"Guess it's just not meant to be," I said quietly.

"There was a time, earlier, I really felt we could hang in and find this buck," Teddy remarked. "But now I don't feel good about it at all. We've only had that one small drop of blood and a couple of tracks in the last two hours."

Deep in my stomach, the nausea was returning. First light was still an hour away. We settled back into the leaves to wait it out. With day, we would make one last try. There was silence between us. Almost imperceptibly the black of night traded into the faint gray of day. Thin tendrils of vapor climbed gently from the beaver ponds and grew slowly into morning mist, veiling the stand of oaks, gums and poplars guarding the lowland. We rested there, lulled by its mood and song, reluctant to disturb its peace. Reluctant to press our fate.

Finally, when it was light enough to see without the lights, we pulled ourselves up stiffly and stretched the kinks out. "I'm going back up the creek and look one last time," Teddy said. "Maybe I'll get lucky again."

Neither of us could muster much enthusiasm. That hadn't changed after another empty hour. I had been 200 yards down the creek and was returning to comb the immediate area of the crossing for the umpteenth time. I literally jumped when Teddy's excited voice boomed through the morning stillness.

"Blood! A good bit of it!"

"Where are you?" I yelled.

"Up the branch swale."

I took off running in his direction. When I got there, I was breathing hard, but it wasn't from the run. He pointed to a big red splotch along the east side of the branch, and another no more than a foot ahead of the first.

"I came almost this far last night," he explained excitedly. "If I had just come a few yards farther, I would have found it then."

"Well, you found it. That's what's important."

Inexplicably, the blood trail had resumed and was growing stronger with every step we took. It was easily visible now and Teddy was ahead, pointing it out as we went. Everywhere he did, I threw down a piece of toilet paper. We leapfrogged for 40 yards, oblivious to anything but our quest. Then my back grew stiff and I straightened to stretch. When I did I saw *HIM*!

It took a moment for my brain to read the message my eyes were sending, and even then it asked for a confirmation. In the same instant I was sure, I cried, "There he is, Teddy! THERE HE IS!"

"You're kiddin'," Teddy exclaimed, in utter disbelief.

"No! There he is!"

He was lying 20 yard ahead on the far side of a downed log, gray as the morning mist. He had fallen facing his backtrail. This, no doubt, was his place, and he had returned to it in the end.

We held back, emotion swelling within us until it could be contained no longer. Then I grabbed Teddy in a bear hug and we danced through the briers and the honeysuckle like crazy men, crying and laughing and whooping in unfettered jubilation.

He was grand. Kneeling beside him, I traced the length of the burnished beams and the graceful curve of his muzzle with the tips of my fingers.

"Ten points! Ten points," Teddy kept happily repeating.

I collapsed against a stump, drinking it all in. I wanted to remember it as it was, before the first rays of the morning sun chased the dark shadows from the creek bottom and lit the fires in the maples on the hillside, freshly painted with the brush of autumn. I glanced at my watch. Eight o'clock of a new day. More than 14 hours since it had begun, 14 long, hard, happy hours we would never forget. Greater than the memory of the deer, grand as he was, would be the way it all felt—the fine, simple sense of mutual pride in being honest to the hunt, in sticking with something and perservering when the odds were against it.

I had gained a great buck with the bow. And I had gained a son-in-law. Folks had said it happened at the wedding. It didn't. It happened that night in the deer woods. Over the Jubilation Buck. ☒

*Young Largemouth Bass Don't Move*

# Study May Explain Why Bass Stocking Fails in Reservoirs

*Written and Edited by Vic Venters*

It's been a mystery why efforts to stock existing and older reservoirs in the Southeast with largemouth bass have generally failed. Studies have shown that reservoirs underpopulated with bass offer the popular game-fish a deluxe habitat and plenty of their favorite foods—shad and sunfish.

Now, a group of scientists at North Carolina State University, who for six years have studied bass and their ecosystems at Jordan Lake in Chatham County, have found what they believe is a likely answer to the stocking failures.

Dr. Richard Noble, N.C. State University professor of zoology and forestry, and his research team have found that during the first 15 months, young bass hardly move at all from the site they were stocked at. "During their youth, the largemouth bass stay within a stone's throw or two, even though they have an entire lake to swim around in," Noble said. More than 80 percent of the fish stayed within 90 meters of the spot where they had been stocked.

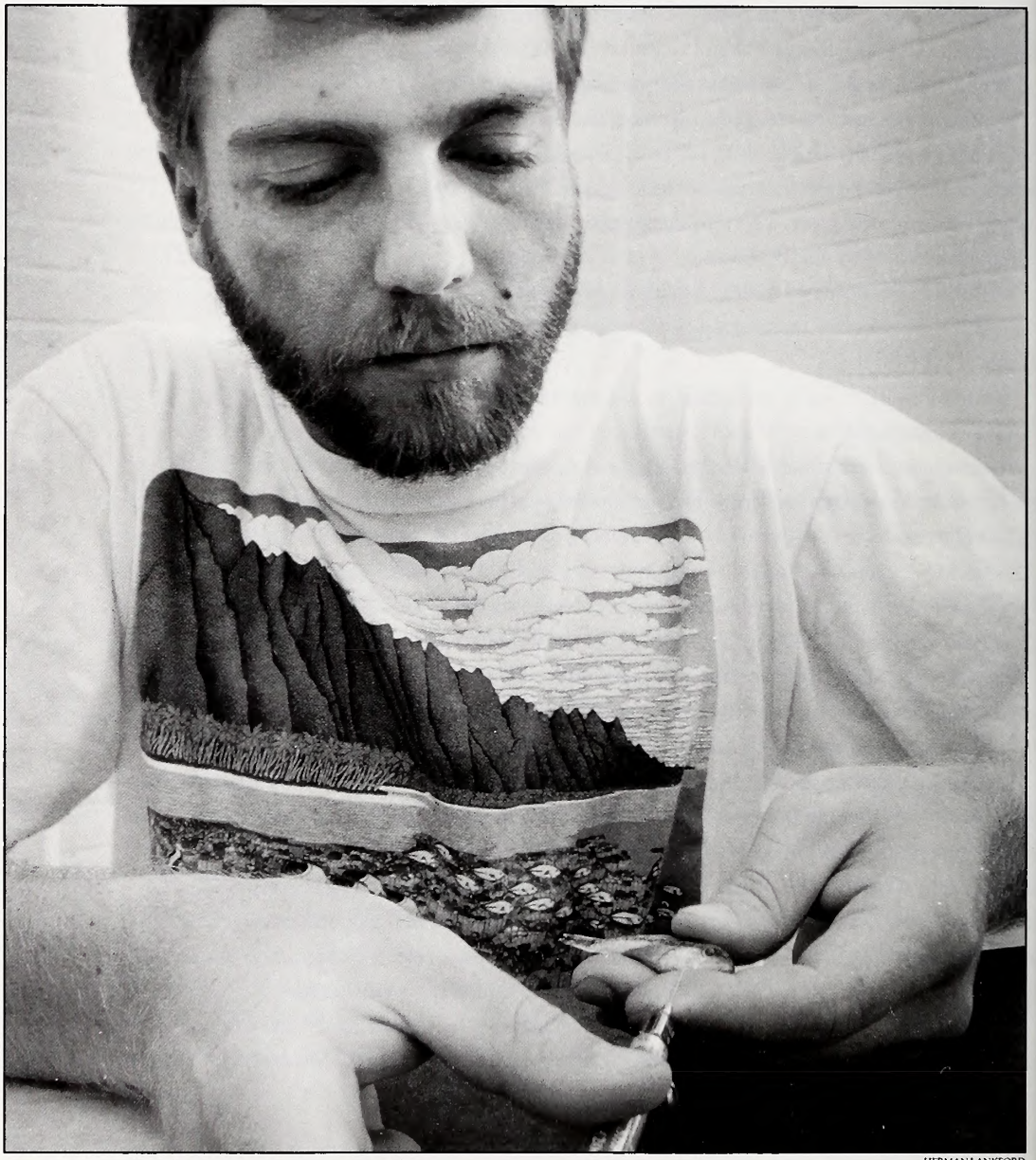
It's no wonder, Noble says, that dumping thousands of newly hatched bass into established lakes similar to Jordan Lake has been futile. The research indicates that hatchlings dumped in the middle of a reservoir would probably fall victim to predators or not find enough to eat.

While adult bass will be found throughout the lake, the study found these stocked fingerlings almost always spend their first year in the shallow embayments off the main lake.

The scientists tracked the fish by injecting a tiny coded metallic tag into their cheeks with a hypodermic needle. Over 15 months, the fish were periodically collected in nets and passed one-by-one over a magnetic detector to locate the tagged fish. The code on each tag was then identified under a microscope.

The study's findings may change the way large reservoirs are managed because the study indicates the need to concentrate on stocking small, potentially productive niches on the lake. While the findings provide hope that more localized stocking programs may one day succeed, Noble says the scientists still don't have all the information they need. Additional research is needed to determine which variables are most important for fingerling survival, including availability of cover, food and the presence of predators. Noble's research has been funded by the N.C. Wildlife Resources Commission, which distributes federal aid from Sportfish Restoration funds.

*—Laura Herbst*
*N.C.S.U. Information Services*



HERMAN LANKFORD

***Biologist J. Randy Jackson** at N.C. State University injects a tiny metallic tag into a fingerling largemouth bass. The tagging was part of a recently completed study that is shedding new light on bass stocking failures.*

*Sportsmen's Alliance Provides Support*

## Reward Program Targets Violators

The N.C. Wildlife Resources Commission has joined hands with the N.C. Sportsmen's Alliance Foundation to form the Wildlife Watch Reward Program.

Under the program, individuals who offer information leading to convictions in several areas of wildlife law violations will receive monetary awards.

Strat Donnell, executive director of the Sportsmen's Alliance, said the object of the reward program is to encourage all wildlife enthusiasts to do "what's right," not for the reward, but for the sake of wildlife programs in the state. "This program will provide an excellent chance for sportsmen to work with the Commission's enforcement division to get the game- and fishing-law violators out of the woods and off the waters," Donnell said. "I think this will really promote cooperation between enforcement officers, concerned sportsmen and all wildlife enthusiasts, be they hikers, fishermen or birdwatchers."

Donnell stressed that the rewards program will be targeted against the habitual wildlife violator whose illegal actions hurt not only the wildlife resource, but the image of law-abiding sportsmen, as well. "Initially, we're going to base the reward amounts on the severity of the case," Donnell said. "Rewards up to $1,000 will be handed out upon conviction." Donnell added that rewards could exceed this amount in special cases.

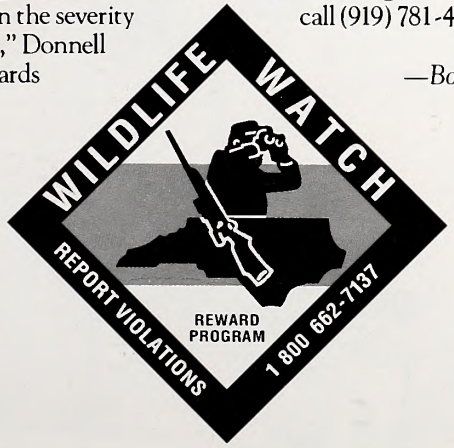
The Wildlife Commission will provide the hot-line telephone number while the Sportsmen's Alliance reward committee will administer the program and provide personnel as needed.

The North Carolina rewards program is patterned after similar programs in other states across the country that have proven successful in combating violators. "We looked at a lot of programs in other states and think we've come up with something that will work best in North Carolina," Donnell said.

Other North Carolina wildlife and conservation organizations will be urged to participate in the program and private funds will also be solicited. "Organizations such as the N.C. Wild Turkey Federation and the N.C. Bowhunters will be asked to take part," said Donnell. "We also hope to get financial help from individuals, corporations or anyone who enjoys our state's wildlife, whether they hunt and fish or not."

The hot-line number is 1-800-662-7137. For more information, contact the N.C. Sportsmen's Alliance Foundation, P.O. Box 31163, Raleigh, N.C. 27612, or call (919) 781-4570.

—*Bodie McDowell*




*Long-time Outdoor Writer*

## McDowell Named Information Officer

Veteran outdoor writer Bodie McDowell has joined the N.C. Wildlife Resources Commission as public information officer.

A native of Greenwood, South Carolina, McDowell was previously outdoor editor of the *Greensboro News & Record* for 28 years. Earlier in his career, he served as outdoors editor of the Augusta, Ga., *Chronicle* and as sports editor of the Greenwood *Index-Journal*.

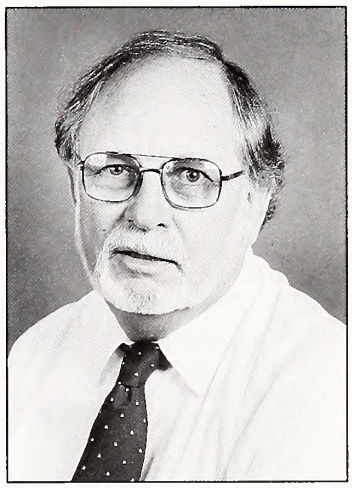
His coverage of the North Carolina outdoor scene has included conservation, fishing, hunting, wildlife habitat, camping, shooting sports, backpacking, hiking and boating.

McDowell not only has written articles from most of the 100 counties of North Carolina, his columns and features also have been datelined from many states and several foreign countries.

His honors include writing awards from the N.C. Associated Press, the Outdoor Writers Association of America and the Southeastern Outdoor Press Association. He also served as president of OWAA and SEOPA, and has received the most prestigious awards those two organizations bestow. He has received the Governor's Award for Conservation Communications presented by the N.C. Wildlife Federation four times.

Founding the OWAA Scholarship Fund, which now amounts to $255,000 and provides four scholarships of $3,500 each annually, was a highlight of McDowell's newspaper career. In 1984, the fund was named the Bodie McDowell Scholarship Fund in his honor.

The most unusual honor for McDowell came in 1988 when the Wildlife Resources Commission named the white bass, striped bass hybrid the Bodie bass in his honor. That came about because he complained to the Wildlife Commission that he had to explain what a hybrid bass was every time he wrote about it.



***Veteran outdoor writer** and editor Bodie McDowell recently joined the Wildlife Resources Commission as public information officer.*

When not writing about the outdoor sports, McDowell enjoys working with youngsters in fishing and hunting clinics, and has worked with Wildlife Commission employees and wildlife clubs in conducting clinics for youngsters.

## Calendar

Readers should check with the contact listed below before traveling to an event.

**Oct. 3**

The fourth annual Simmons Sea Skiff Day will be held at the Cape Fear Museum in Wilmington. Sea Skiff displays will be featured, along with a presentation by Nelson Silva, a professional boat builder and restorer of Sea Skiffs. For more information, contact Dave Carnell at (919) 686-4184, or the Cape Fear Museum at (919) 341-4350.

*Success Rates Down Slightly*

## Grouse Hunters Had Good Season

North Carolina grouse hunters enjoyed another successful season last year, although flush and harvest rates were down slightly from the previous year. Still, both hunter success and birds flushed remained above comparitive rates from the mid-1980s.

The data comes from the N.C. Wildlife Resources Commission's annual Avid Grouse Hunter Survey which tracks long-term flush and harvest rates of grouse hunters.

Last year, for instance, the survey tracked the success of results from 68 hunters participating in 1,193 hunts in western North Carolina.

On average, hunters flushed an average of 5.3 birds per trip last year, but killed only .80 birds per trip. In last year's 1991-92 season, each avid grouse hunter took 17.5 trips per season, and harvested almost 14 birds per hunting party per season. This is a slight decrease from 18.4 trips per season and an average seasonal bag of 16.3 birds from the 1990-91 season.

The Wildlife Commission is especially interested in receiving hunting reports from Graham, Transylvania, Mitchell and McDowell counties. If you are interested in joining the Avid Grouse Hunter program, contact Terry Sharpe, NCWRC, 317 Hamlet Ave., Hamlet, NC 28345.

### Field Notes

| | |
|---|---|
| Dove (first season) | Closes Oct. 3 |
| Rails, gallinules and moorhens | Closes Nov. 13 |
| Eastern Bow and Arrow Deer | Closes Oct. 3 |
| Western Bow and Arrow Deer | Closes Oct. 3<br>Reopens Oct. 12 |
| Central Bow and Arrow Deer | Closes Nov. 7 |
| Northwestern Bow and Arrow Deer | Closes Nov. 14 |
| Eastern Muzzleloading Deer | Oct. 5-Oct. 10 |
| Western Muzzleloading Deer | Oct. 5-Oct. 10 |
| Eastern Gun Deer | Opens Oct. 12 |
| Wild Boar (first season) | Opens Oct. 12 |
| Black Bear | See *Regulations Digest* |
| Raccoon & Opossum | See *Regulations Digest* |
| Crow | See *Regulations Digest* |
| Gray Squirrel | Opens Oct. 12 |
| Fox Squirrel | See *Regulations Digest* |
| Ruffed Grouse | Opens Oct. 12 |
| Fox | See *Regulations Digest* |

Migratory waterfowl regulations unavailable at press time. Check with license agents or the N.C. Wildlife Resources Commission after Oct. 1, 1992. Information on bag limits, either-sex hunts and other regulations may be found in the *1992-93 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest.*

*Book Review*

## A Family Goes Hunting

*A Family Goes Hunting, by Dorothy Hinshaw Patent; Photographs by William Munoz. Published by Clarion Books, New York, hardcover, black/white photos, 64 pages, 1991. $14.95.*

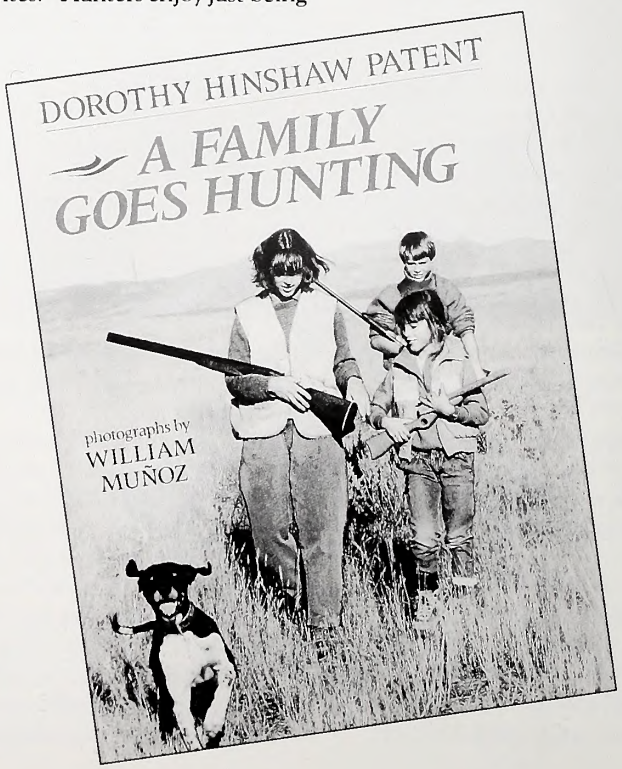
The author opens this children's book with these provocative comments: "When I moved to Montana in 1972, I was surprised to discover how many people I met were hunters. I wondered about them—how could they shoot wild animals? I couldn't understand why they would want to do such a thing."

Dorothy Patent then uses the rest of the book to answer these questions. *A Family Goes Hunting* follows the Cox family of Montana before and during their state's hunting season for upland birds and big game.

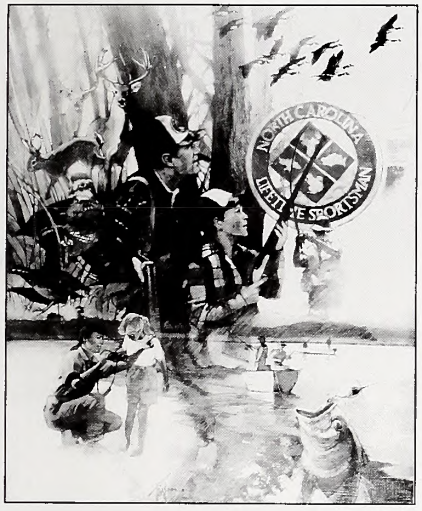
The book offers an understandable and reasoned defense of ethical and safe hunting practices as well as presenting the larger reasons of why hunters hunt. "Hunting provides a way of feeling part of nature," Patent writes. "Hunters enjoy just being outdoors, smelling the fresh scent of the woods, being alert to signs that wild animals are around, and getting a good workout walking for miles. But the experience of hunting an animal provides an even deeper sense of connection with the natural world."

All members of the Cox family are hunters—husband, wife and the two children. Gun safety and respect for laws and wildlife are welcome themes throughout the book, and an explanation of the health benefits of eating wild game is also provided. In addition, hunting's pivotal role in modern wildlife management is clearly explained. Excellent black and white photo illustrate the book throughout.

Not only should this book be of interest to children of hunting families, but *A Family Goes Hunting* should also serve an excellent counterpoint to some of the more anthropomorphic views of hunting and wildlife being offered to children today.



## Wildlife Endowment Fund Report



**July 1992**

Principal Balance
$17,129,225.30
Interest Earned
$9,840,919.48
Total Receipts
$26,970,144.78
Interest Used
$4,123,817.48
Fund Balance
$22,846,327.30

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

*Deadline This Month*

## Take Pride in America Contest

For the sixth year, North Carolina will participate in the Take Pride in America (TPIA) awards program for 1992. Take Pride in America is a national and statewide campaign to increase awareness of the need for wise use of natural and cultural resources, and to encourage a sense of stewardship and responsibility toward public lands through volunteerism.

The awards program recognizes outstanding volunteer stewardship efforts by individuals, groups and businesses on behalf of the state's natural and cultural resources. The awards program is open to individuals or groups. The activities for this awards cycle must have been initiated, accomplished or ongoing in 1991 and/or 1992.

Completed nomination forms must be postmarked by October 26, 1992. Nomination forms and TPIA information is available by contacting Take Pride in America, Division of Parks and Recreation, Archdale Building, P.O. Box 27687, Raleigh, N.C. 27611.

## Foundation Donates Book

The N.C. Sportsmen's Alliance Foundation has purchased and donated copies of *A Family Goes Hunting* (see review, p. 30) to the public school libraries in Wake and Franklin counties, and is actively soliciting donations for the purchase of books to be distributed to school libraries across the state.

For more information, contact the N.C. Sportsmen's Alliance Foundation, P.O. Box 31163, Raleigh, N.C. 27612, or call (919) 781-4570.

## The 1993 North Carolina Wildlife Calendar Is Here!

***With such artwork*** *as Joe Seme's "Ward Brothers Canvasbacks" featured above, the North Carolina Wildlife Calendar is sure to sell out again this year.*

The works of Robert C. Flowers, Jr., Brooks Pearce, David E. Doss, Robert B. Dance, Bob Herr, Duane Raver, Mel Steele, James A. Brooks, Joe Seme, and Dempsey Essick are featured in the 1993 Wildlife Calendar. Order yours today by returning the form below with your check or money order to 1993 Calendar, N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, N.C. 27604-1188.

**ORDER TODAY!**

Please send me ..... N.C. Wildlife Calendars at $6.00 each $_____
All N.C. residents add $.36 sales tax per calendar _____
No sales tax for out of state residents.
Enclosed is my check for ..... Total $_____

**If ordering 7 or more calendars, please provide your UPS deliverable address.**

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Send order to: 1993 CALENDAR; N.C. Wildlife Resources Commission; 512 N. Salisbury Street; Raleigh, N.C. 27604-1188
Office located at: 322 Chapanoke Rd., Raleigh N.C. 27603

All orders must be prepaid. We do not bill. A $20.00 charge will be made on returned checks (N.C.G.S. 25-3-512).

**For fund raising and bulk rate information (10 calendars or more), call 919-662-4377. Please allow 6 weeks for delivery.**

CALO93

# Animal Inns

*by Vic Venters*

Dead trees have traditionally been looked upon in two ways: as an eyesore or as a good source of firewood. Either way, they are usually cut down, hauled away or burned. But for nearly a third of the birds, mammals, reptiles and amphibians in our nation's forests, these dead or dying trees are absolutely critical in providing their life needs. For example, over 550 species of birds and 300 species of mammals depend on dead or dying trees for shelter, nesting habitat or as foraging areas.

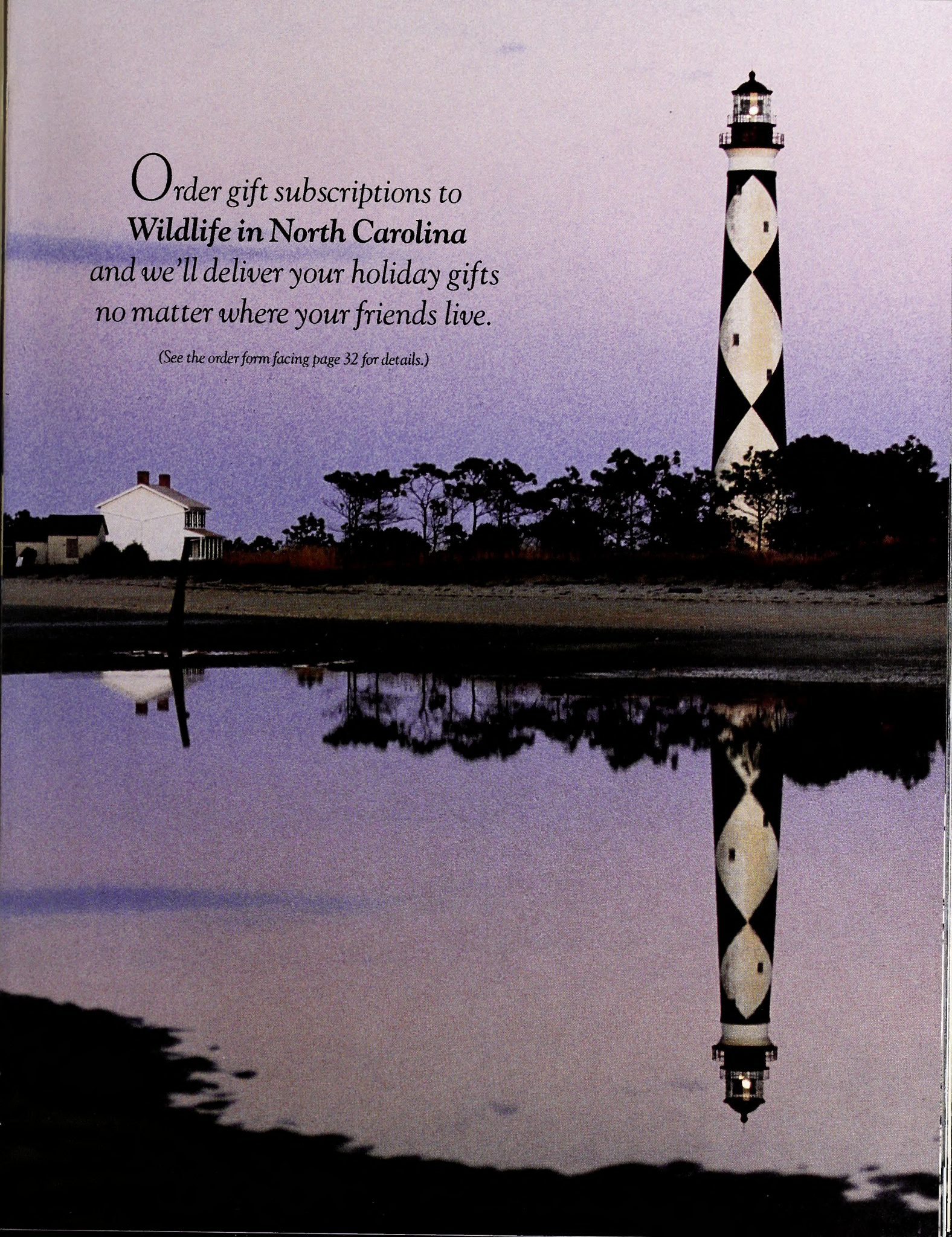
*Animal Inns* is a public/private program designed to increase the public's awareness of the value of dead, dying and hollow trees for wildlife—hence the group's motto, "There's life in dead trees." Originally initiated by the U.S. Forest Service and the Bureau of Land Management, the program can provide corporations, individuals, parks, foresters and others with information needed to preserve this type of wildlife habitat on private or public lands.

For instance, if you own a woodlot or small timber tract, *Animal Inns* encourages you to:

- Leave trees with broken tops, trunk holes or visible nests.
- Leave some snag trees throughout the area unless they will pose a danger to people or property.
- Protect live trees with cavities in them.
- Create future wildlife habitat by retaining some live trees with broken tops or those with short limb stubs.
- Remember that fallen trees on the ground can provide valuable habitat and should not be destroyed.
- Work with state and local governments to develop an *Animal Inns* program in your community.

*Animal Inns*, it should be stressed, is entirely voluntary and is not a regulatory program. Standing dead, dying or hollow trees can also sometimes present a safety hazard, especially in residential areas or during timber-harvesting operations.

Consult with your forester or resource agency specialist for more information or advice. For booklets, brochures, tree-marking signs or more information on the *Animal Inns* program, contact *Animal Inns*, P.O. Box 5065, Bend, Oregon, 97708-5056, or call (503) 385-5942.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Wildlife in North Carolina
and we'll deliver your holiday gifts
no matter where your friends live.
(See the order form facing page 32 for details.)

## Cedar Waxwing

A cedar waxwing pauses for a drink, or perhaps to check out its handsome image reflected in the pool. Waxwings may have been among the many land-based birds that Columbus saw in the mid-Atlantic. Only recently have ornithologists linked those sightings to unusual migration patterns.

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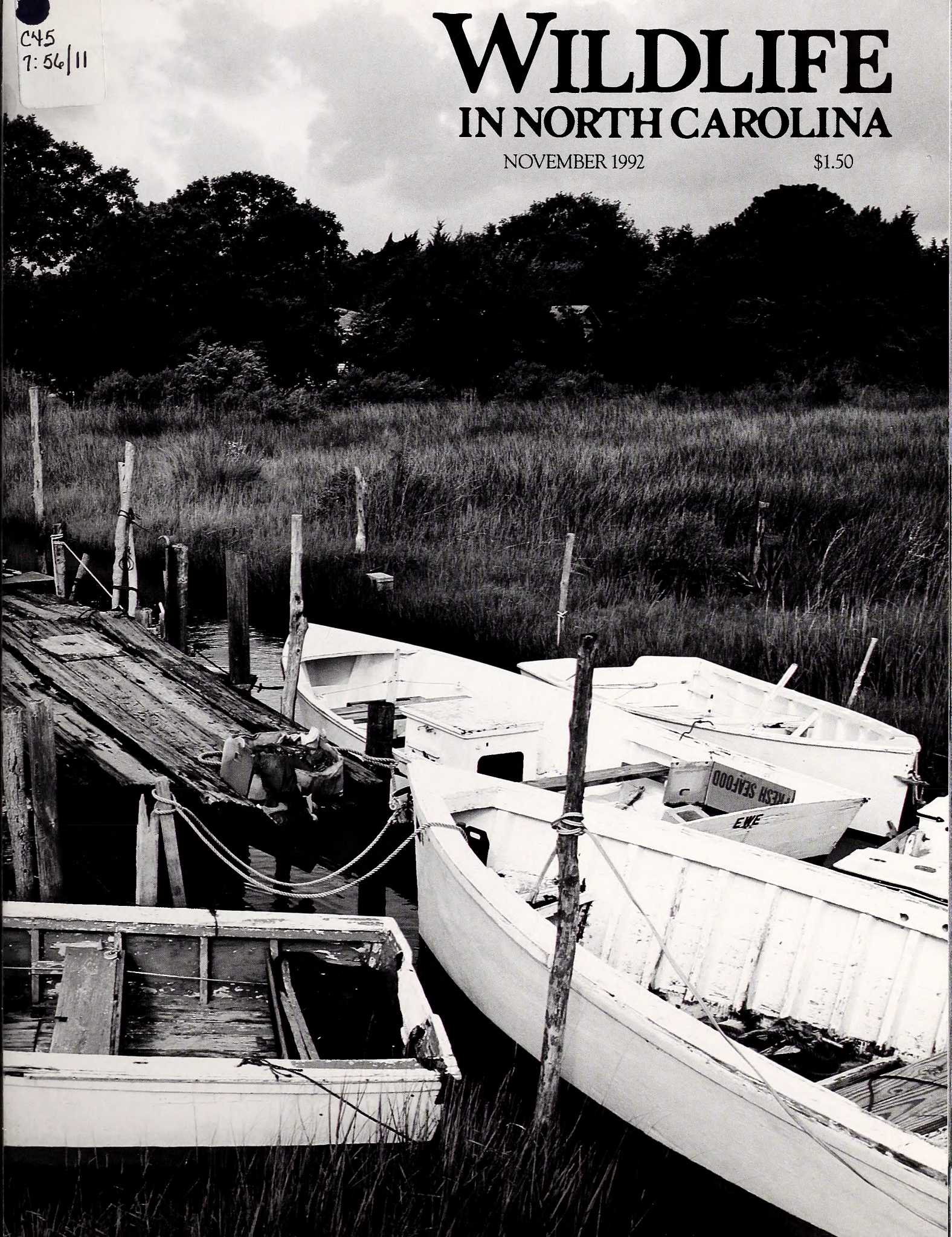
# WILDLIFE IN NORTH CAROLINA

NOVEMBER 1992 $1.50



# Dressed to Kill

*by Jim Dean*

I had a vague sense of apprehension the minute I spotted the advertisement. A stunning woman with immaculate blond hair was standing knee-deep in a salt marsh. She was holding a clam rake in an unfamilar manner, the way Mother Teresa might hold, say, a .454 Casull. The young lady's smile seemed a bit forced, too, no doubt because she had been out there in the hot sun posing among mosquitos and deer flies for a long time. Obviously, she had also observed that salt marshes do not smell quite as good as your average lawn.

It was what she was wearing, however, that gave me hives. She had on a pink, button-down cotton shirt and plaid Bermuda shorts, the type that look like a hybrid between bloomers and a skirt. Draped casually over her shoulders was a lime green sweater with the sleeves looped into a lazy knot across the front. Somebody had shod her with a pair of hip boots rolled down the way a Harkers Island loon hunter might wear them, except they were uncommonly clean. Somehow, you sensed that an assistant was standing close by with a garden hose and a 25-gallon drum of bug spray.

ILLUSTRATED BY JACKIE PITTMAN

The title of the photo was "Muffy goes clamming," but Miss Muffy didn't look all that enthused about this new direction in fashion. Neither was I, but I couldn't say exactly why. At the time, it merely looked dumb.

This was about 10 years ago, as I recall, and now we all know where Muffy was headed. Within a few years, *Vogue*, *Glamour*, GQ and other fashion literati were hyping the raw, primitive look that had so long been the dominion of nomads, hunters, arctic explorers, fishermen, bird dog trainers and various other old coots and unrepentent originals. Now, we've got ersatz cowboys like Calvin Klein skipping around New York City in pre-distressed denim jackets and jeans (he couldn't distress his own, for heaven sakes?). Polo—Polo?—is marketing hunting shirts (just the thing for an animal rights demonstration). Venerable Abercrombie & Fitch went bankrupt and was reborn as a preppie haberdashery more likely to sell you a tie rack than a gun rack.

You can even see the changes in the catalogs of such long-time outdoor suppliers as Eddie Bauer and L.L. Bean. Bean still carries high-quality hunting and fishing stuff, including those wonderful rubber-bottomed hunting boots, but you're just as likely these days to see those boots in a gourmet coffee shop as in a thicket of briers and honeysuckle. Indeed, if it weren't for the ads for scented dog beds, most modern sporting catalogs could easily be confused with those from Victoria's Secret (no dogs there, for sure).

We strike back where we can, of course. One friend of mine recently encountered an acquaintance at a board meeting wearing ostrich-skin cowboy boots with sterling silver toes. Sensing a rare opportunity, he sidled up and asked, "Do you know the difference between a real cowboy and a fake cowboy?" "Why, no," came the reply. "Real cowboys have the manure on the outside of their boots," my friend said.

Yet, despite scoring an occasional direct hit, we've clearly lost the war. City streets are full of candy-striped four-wheel drive vehicles that have never been off the pavement, and they're carrying wives on grocery safaris or bankers dressed as though they were going on a moose hunt during their lunch hour. Briefcases and purses have been replaced by fishing vests and backpacks. What's next: holsters for hair dryers or blaze-orange bustiers and treebark stockings?

This phenonenom has been explained as a secret desire to get in touch with our "inner hairy person" and rediscover the vanishing wilderness. Presumably, this is the same wilderness we have been so diligently paving over. Others say it's also an expression of individuality, but perhaps you have noticed that nonconformists always dress alike (remember the tie-dyed T-shirts of the '60s?).

All I know is that this trend doesn't seem to have had much impact on those who actually spend any considerable amount of time outdoors. Much to his wife's dismay, a certain senior member of our family still wears the same threadbare, zipper-sprung hunting pants he bought shortly after high school. Because most of the belt loops are long gone and his waist is a bit thicker, the pants are held together by a piece of tobacco twine (pay attention, Calvin!). His favorite old flannel shirt—worn buttoned at the neck—was one-third of a "three for $5" special about 1950. His hat is a feed store freebie, his shell vest belonged to his father and his boots are Cloverine Salve premiums.

The fact is that real outdoorsmen buy clothes only once in their lifetime, and then only if they haven't been fortunate enough to inherit them. Clearly, this group does not constitute a vast pool of potential sales, so I suppose it is natural for outdoor clothiers to expand into other markets. But you have to wonder what wilderness experience is recaptured in a $220 mauve hunting jacket or, for that matter, a camouflage bikini.

November, 1992
Volume 56, Number 11

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources.

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**Back of the Book** *by Vic Venters*

**Wildlife Through the Year** *by Vic Venters*

**Cover** *Wooden fishing boats wait at this dock near the seacoast village of Atlantic for the hard work that surely lies ahead. Photograph by Lawrence S. Earley.*

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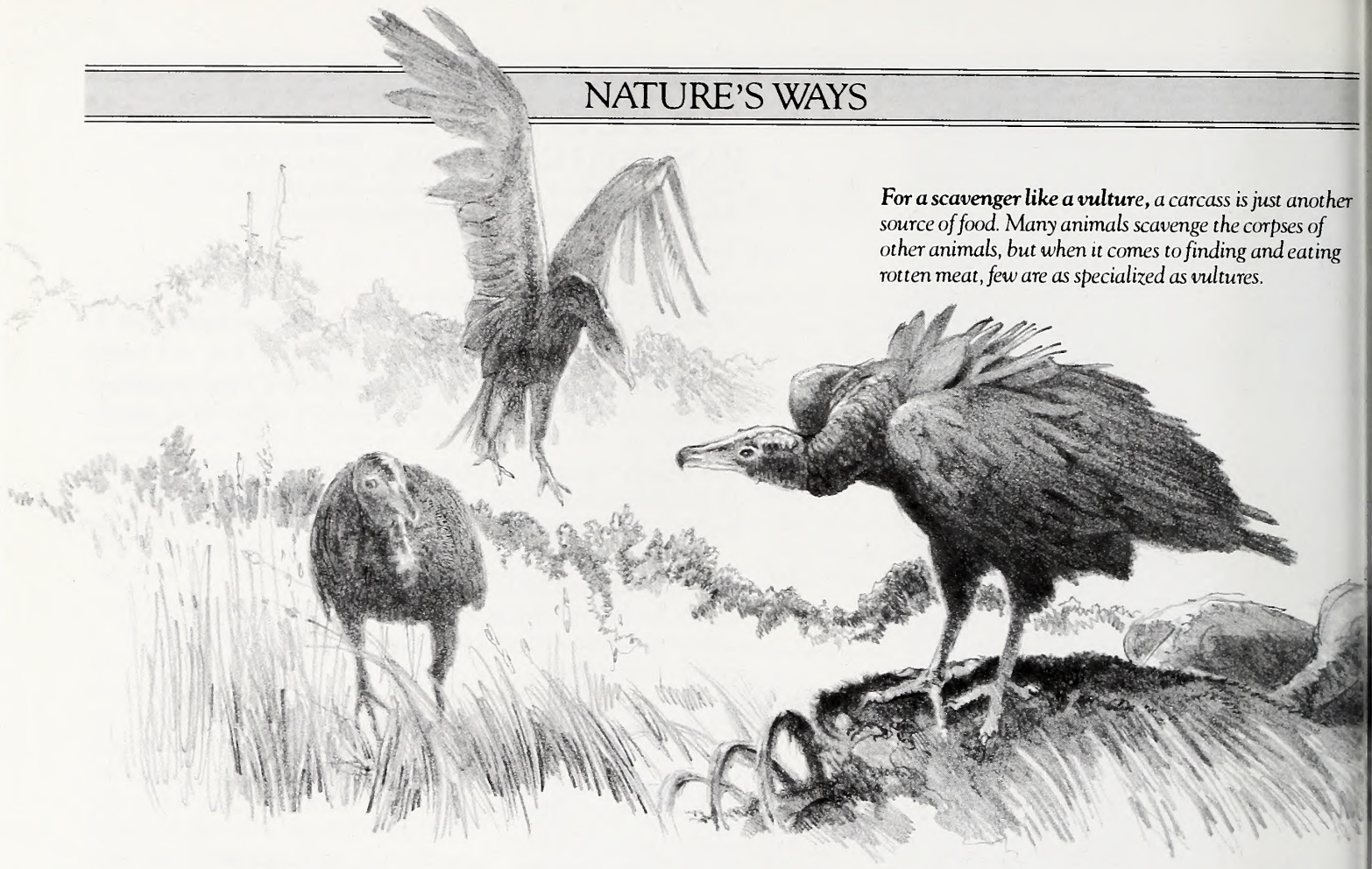
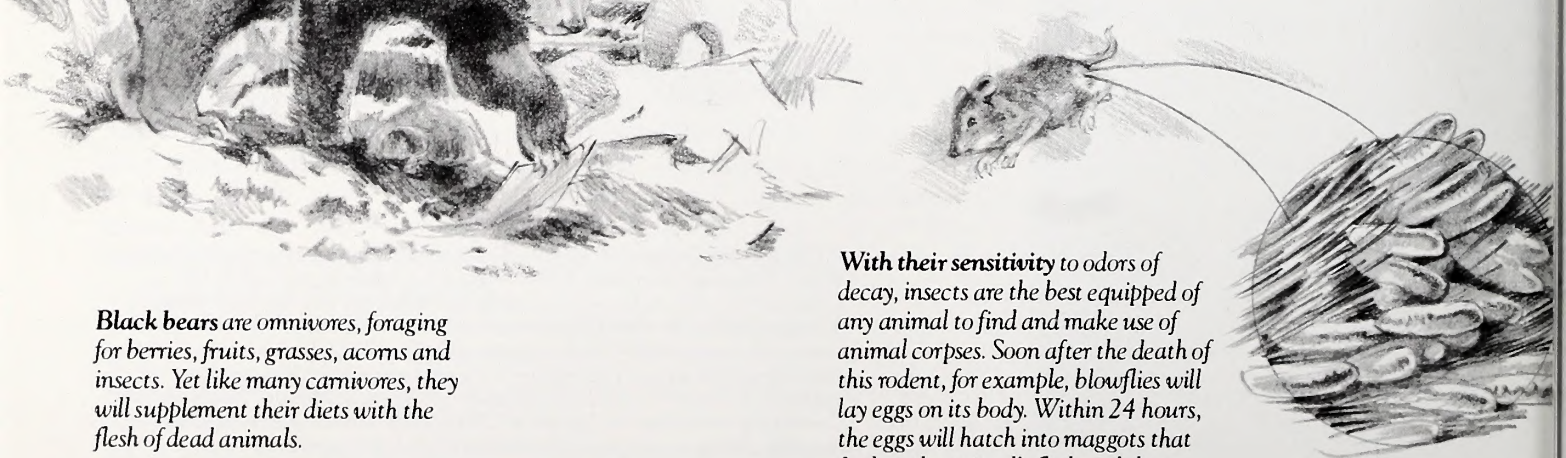


***For a scavenger like a vulture,*** *a carcass is just another source of food. Many animals scavenge the corpses of other animals, but when it comes to finding and eating rotten meat, few are as specialized as vultures.*

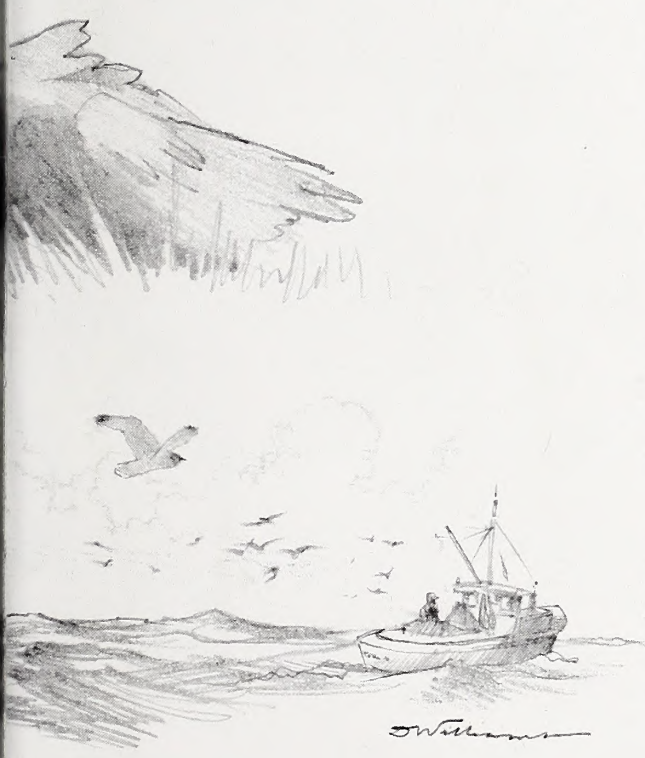
***Black bears*** *are omnivores, foraging for berries, fruits, grasses, acorns and insects. Yet like many carnivores, they will supplement their diets with the flesh of dead animals.*



***With their sensitivity*** *to odors of decay, insects are the best equipped of any animal to find and make use of animal corpses. Soon after the death of this rodent, for example, blowflies will lay eggs on its body. Within 24 hours, the eggs will hatch into maggots that feed on the animal's flesh and themselves become food for other animals.*

# Nature's Sanitary Engineers

*written by Lawrence S. Earley/illustrated by David Williams*



***Gulls are so efficient** at scavenging that the proliferation of land fills (garbage dumps) along the East Coast has encouraged many species to expand their ranges. Gulls are also familiar scavengers at sea, following fishing boats for miles in anticipation of feasting on discarded fish remains.*

It's difficult to approach the subject of scavengers without at least a momentary shudder of revulsion. Anything that sinks its snout into carrion, often after it begins to stink, is, well, just not our kind of animal. Yet as nature's garbagemen, scavengers serve a critical function. For not only do they prevent animal corpses from cluttering up our streets, backyards, woodlands and waterways, they also help complete the cycle of life.

Scavengers include animals in just about every group, from vultures in terrestrial ecosystems to turtles, crayfish and catfish in aquatic systems. Of all North American vertebrate scavengers, the vulture is probably best known. Turkey vultures and black vultures are familiar parts of our landscape, lazily soaring overhead singly or in larger groups when they've located food. Their heads are almost completely featherless, an adaptation that enables them to feed more cleanly on often putrescent flesh. Another adaptation to their almost exlusive diet of carrion is an immune system that wards off bacteria and other diseases which build up in corpses. Meat so rotten that it would kill some animals is caviar to a vulture.

Seagulls are also well-known scavengers. They will eat anything dead, whether it's a fish or a dead cat that floats to shore. Gulls are also notorious squatters in land fills, feeding on garbage and filling the air with their raucous cries. Indeed, the spread of land fills up and down the East Coast has been chiefly responsible for incursions of herring gulls and great black-backed gulls into North Carolina during the past 25 years.

Yet gulls aren't exclusively carrion-feeders. Indeed, making a living exclusively from dead things would be difficult for most vertebrate creatures. Animals don't die in predictable places, and so carrion eaters would expend more energy locating corpses than they'd get from eating them. That's why the vulture is one of the few to be successful at it. Vultures have an exquisite sense of smell to guide them to a carcass; they conserve energy by soaring; and their downward spiralling when they find a corpse signals others to gather, another way energy is saved.

As a result, most terrestrial scavengers are insects of different kinds—mostly beetles and winged insects. Carrion beetles drag small carcasses into protected places, lay their eggs on them and then cover them. The larvae feed off of the bodies. Blowflies lay masses of eggs on dead animals. The maggots hatch in 24 hours and although they can't initially feed directly on flesh, they produce enzymes that dissolve the tissue, enabling the maggots to use their mouthparts. Dermestid beetles clean dried flesh from bones so efficiently that technicians in laboratories employ them for this purpose.

One biologist has light-heartedly referred to scavengers as "lazy hunters." But are they? It may be hard to draw the line between a predator and a scavenger for just about every mammalian carnivore is a scavenger at one time or another. Blue jays and chickadees scavenge. The fish-hunting bald eagle, our national symbol, scavenges whatever washes up along river banks and harries better hunters like the osprey into dropping their catches.

In nature, carcasses are just food that animals are adapted to making use of. From a broad perspective, scavengers are part of the decomposition process by which nutrients in organic matter are released to be assimilated by plants once again. Scavengers help to unlock the door of life.

# Uncommon Scents

A dog's nose may be 500 times more sensitive than ours. That explains why your pooch can smell a quail, but not why he loves to roll in a rotting carcass.

by Joel Vance ©1992

Hunters use four senses (of which common is not one): sight, hearing, touch and smell.

All cut both ways—the hunter tries, for example, to see his game, but not be seen by it. Same with the other senses, except scent. Scent is a little different. Unless he's hunting skunks, the hunter's chances of smelling game are slim.

And if he is smelled by his prey, he doesn't want the scent to be that of Joe Hunter. Modern man lives afraid of offending, dousing himself with cologne, painting with deodorant, dreading underarm offense—and then as a hunter anoints himself with stuff that makes him smell like the inside of an old gym shoe. He hopes thereby to neutralize the nose, a major defensive weapon of many game creatures. If you can fool a critter into thinking you're just another love-starved female-of-the-species, or if you can make yourself odoriferously invisible, you've neutralized a prey advantage.

Scent addition or reduction has been around a long time. Hunters boil their clothing and take sweat baths to reduce body scent. Some walk through cowpies to add scent. Are these actions of rational people?

Scent even plays a part in fishing. There are tiny grub-like products that release "a powerful scent and flavors that crappie and panfish crave. Not for human consumption." It's called a Power Bait. Everything today is a Power Something. There are Power Lunches and Power Releases by rock artists. There's no doubt that some fish can detect odors with an acuity never dreamed of by the keenest-nosed pointer. If we could cross Ol' Smoke and a channel catfish, we'd have the ultimate bird dog (unless the dog had the pointer's brain and fins).

LYNDA RICHARDSON

***Almost from the moment they are born,*** *dogs bred to hunt game birds are attracted to the smell of a bobwhite quail. This Brittany spaniel puppy already has the instinct to point. Indeed, so keen is a dog's sense of smell that some old dogs that are blind and deaf can still hunt effectively.*

KEN TAYLOR

***The English pointer** is the premier hunting dog for bobwhite quail in the South and is widely celebrated for its keen nose. There are reports that such dogs have pointed coveys of bobwhites while in the act of retrieving a freshly killed or crippled bird. How a dog can detect other birds with one already under its nose is a mystery.*

Dogs have a sense of smell that is incredible compared to that of a human. It's obvious that it doesn't work the same way as ours does. A dog will bury its muzzle eye deep in reeking substances and inhale them as if they were Parisian Night while the dog owner, whose nose is as dead as a creek boulder, is exclaiming disgustedly, "What is that awful smell!"

If odors affected the dog as they do the man, the dog would keel over in its tracks, nose smoking like a shorted-out electrical circuit. But every bird dog owner has beheld his treasured companion of the fields coming happily to heel smelling like an August road kill. Ol' Streak likes nothing better than to lower his shoulder into a pile of slime that used to be a fellow creature.

Bird dog trainers baptize their training dummies with Eau de Grouse or Quail. If the hunter holds a real game bird to his nose, he will detect nothing other than a faint mustiness, like an old pillow. The essence of the bird, at least as it appears to the dog's nose, is absent.

Experts estimate a dog's nose is 500 times keener than ours, but it may be even more accurate. Stanford University researchers once boiled glass ashtrays to remove all scent, buried them 8 inches deep on a beach and let two tides wash the sand. Several dogs located the buried ashtrays with an 80 percent accuracy.

There has been little research into the mysteries of dog olfaction. A German researcher, Karl Zuschneid, believes that a dog can detect odors invisible to a gas chromatograph, a very sensitive laboratory instrument. Zuschneid concludes that experienced dogs can distinguish among different scent tracks and be "scent faithful," which explains how a bird dog can trail a running pheasant through an area with many birds laying down scent tracks.

And think of the sensitivity involved when a dog happens on a track and figures out which way the creature went. Now if hunters could only figure out which way the dog went.

Another good question: Why does a bird dog react to a game bird he's never hunted before? Is there a smell common to game birds? A "gallinaceous" smell is understandable (most upland birds are in that family), but hunting dogs react to waterfowl as well. Does the hunter give subtle body language signals that let the dog know it is a prey species? No one knows. Bird dogs react to the sight of crows flying, but ignore hawks or owls. They tense at meadowlarks, but quickly dismiss them, and don't react at all to the quick flutter of the many small birds.

The leading dog nose expert is Dr. Larry Myers, a vet with Auburn University. Dr. Myers invented and markets the Smell Threshold Test kit (SMETT) that tests a blindfolded dog's ability to smell the test odor at various dilutions. The kit is not only useful for checking Ol' Sal's nasal nimbleness before taking her to the field, but it's also used by lawmen to check out their dope-sniffing dogs.

In the lab, the reactions of blindfolded dogs are measured by electroencephalograms, or EEGs. The average dog owner must read his blindfolded dog's reactions and the dog must be quiet and calm. Some dog owners report mixed success. The test works if the dog is quiet; it doesn't if the dog is uneasy.

Dr. Myers says pointers consistently score high in sensitivity to odors. Not just English pointers, but the German varieties as well. Still, he says there isn't enough raw data to judge one breed superior to another.

Any hunter knows that temperature and humidity affect scenting ability. Other factors include how much the birds have moved, whether it's windy, perhaps even barometric pressure. There is more that isn't known about dog scenting than is.

Biologists use scent for scientific purposes. They estimate furbearer populations with a "scent post," a stick wrapped with scent-drenched material and placed upright in sifted sand or dirt. Animals visiting the post

KEN TAYLOR

***After a successful retrieve,*** *Wilton Pate gives his English pointer a playful whiff of bobwhite. The English setter has already gotten a nose full. Humans cannot appreciate the experience, but it must be intense, like having a hot cinnamon bun waved under your nose.*

to sniff it or leave their mark also leave their tracks.

Trappers also use scents. You can make your own. All you need is the kitchen blender, some animal glands and the most understanding mate ever created. Steve Geary, who is a trapper and a lawyer (a mind-boggling combination) has two pages of lusty lure recipes in his book *Fur Trapping In North America*.

Here's a dandy: "In a quart jar, mix four ounces of rancid fish oil, one ounce muskrat or beaver musk, two ounces of fox urine and allow to age."

Think about that sometime when you're wondering how bad things can get.

Pulitzer Prize-winning cartoonist Bill Mauldin, in his delightful autobiography *A Sort of a Saga*, tells of the time he and his brother Sid took a dislike to a loud-mouthed adult visitor and smeared skunk musk on the manifold of the man's car (they'd gotten the bottle of horror from a fellow-kid trapper who, for reasons unknown, had de-musked the skunks he caught). The revenge was effective: "Far into the following cold winter that car could be seen running around with all its windows open, the Voice inside wearing a heavy coat and wrinkling his nose," Mauldin writes.

Bob Smith, a retired predator-control agent, always carried a small squeeze bottle of coyote urine. Once, at an outdoor seminar on pest animal trapping, he was heckled by a fellow in the crowd. Smith squirted a bit of the urine on the man's pant leg without being seen and the man was distracted the rest of the day by the farm dogs trying to mark him.

Smith once stopped at a farmhouse and was talking to the farmer when he spied an old yellow hound sprawled in the dust, snoozing away.

"That dog always been that yellow?" Smith asked.

"Guess so," replied the farmer. "Never paid much attention."

"Looks like he needs draining to me," Smith said. The farmer was puzzled. "If you don't drain 'em once in a while, they turn yellow on you," Smith added. "Here, I'll do it."

He called the dog over and surreptitiously squirted coyote urine on a fence post. The dog obligingly lifted a leg and endlessly doused the post while the farmer looked on, open-mouthed.

"See," Smith said, "What did I tell you. That dog needed draining."

"Well, I be gol danged!" exclaimed the farmer as Smith climbed back in his car and left him scratching his head.

You learn something new about scent every day. ☒

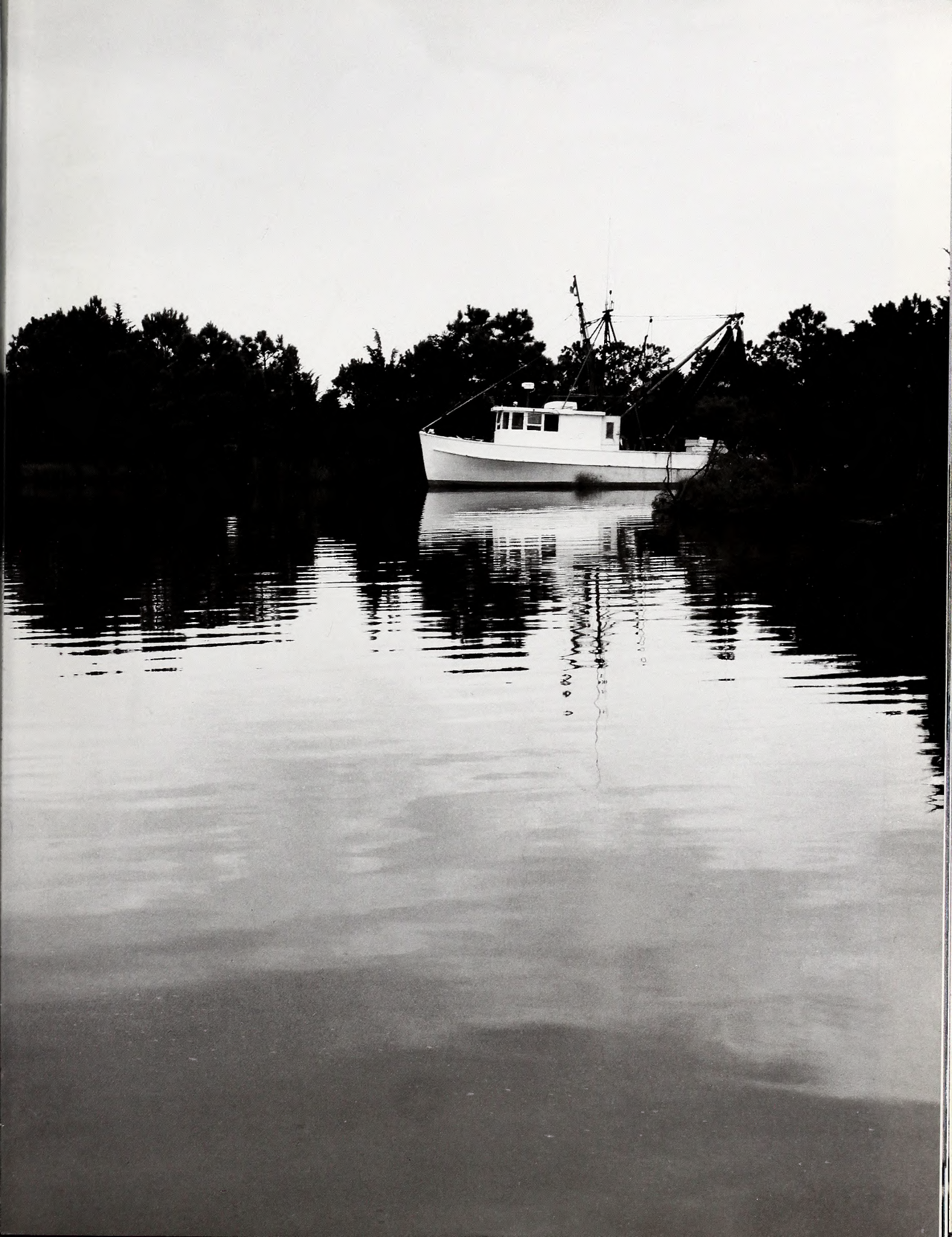
# WORKBOAT

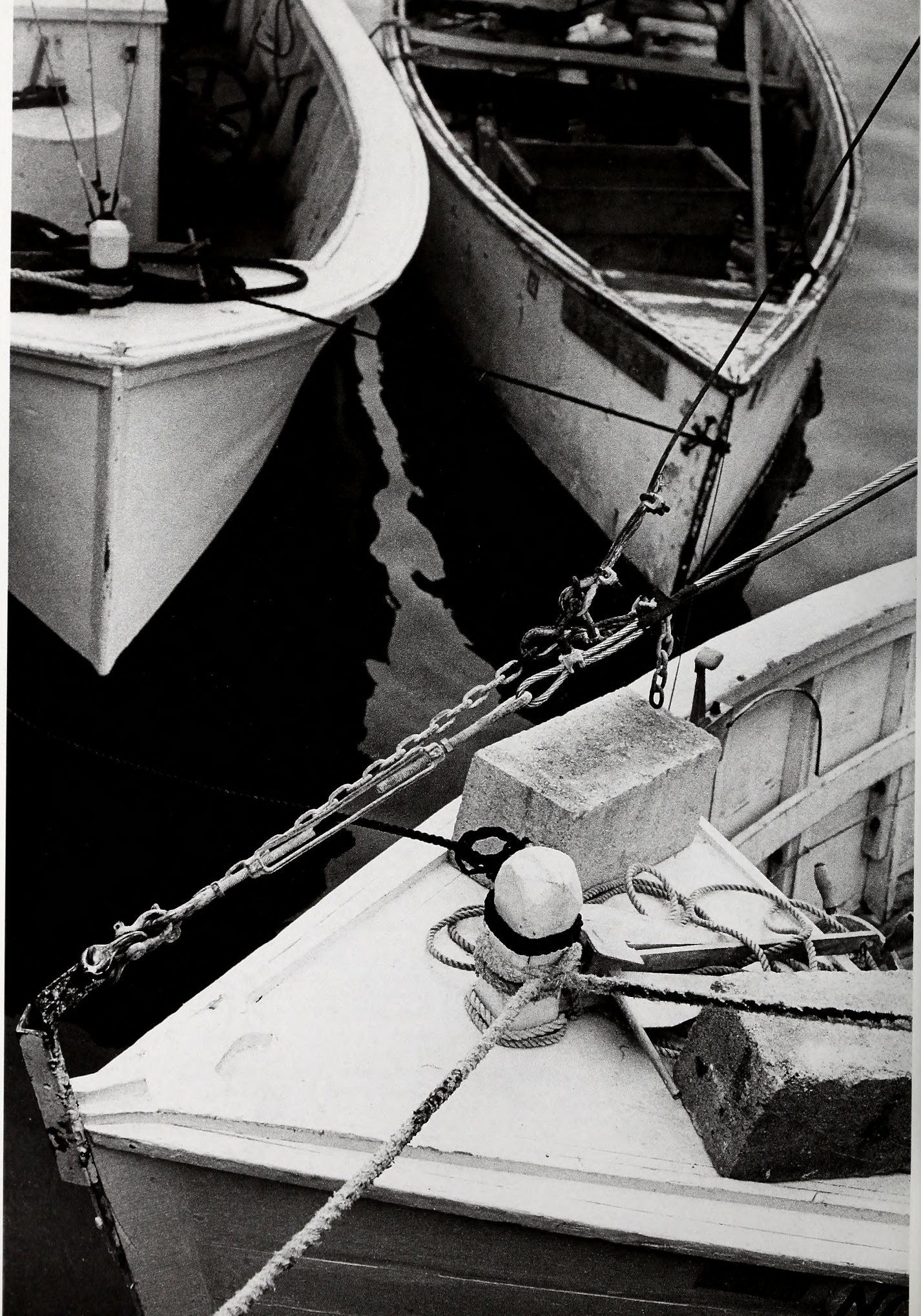
## The handsome wooden workboat is closely identified with our coastal heritage. May it always be so.

written and photographed by Lawrence S. Earley

*You see them in any Core Sound hideaway with water deep enough to float them. Shrimpers, crabbers, skiffs: these muscular workboats seem to be just another part of the coastal scenery, striking pretty poses against marsh and headland, throwing birght reflections against inky water.*

*Yet a workboat marries its graceful form to a function as purposeful as an anvil. The sinuous curve of its bow, called the "Harkers Island flare," throws water well away from the deck. Its rounded stern enables fishermen to haul nets without snagging them. A Core Sound workboat is more than just a pretty face.*





*White is a logical color for a workboat. White is visible against water or sky, a fact you can appreciate if you're in trouble at sea. White reflects sunlight, and makes the deck a cooler place to work in summer. It helps prevent the wood from drying out. Yet already the wooden workboat seems an anachronism. Hewn from living forests of juniper, it is framed out of an understanding of wood and water and seatoss. But with the availability of fiberglass and cheaper materials, the days of the wooden workboat seem numbered.*

*After their life at sea is over, some workboats are stripped of their gear and abandoned, their hulks decaying slowly in the marsh. Others are towed to front yards where they sprout zinnias in their final years. With its paint peeling and its boards sprung, an old workboat is still a lesson in dignity.*

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# Rethinking Fire & Forests

## Experts decided long ago that Smokey Bear was wrong in suppressing all forest fires. Turns out, summer fires are critical to the health of longleaf pine ecosystems.

by Vic Venters

Some 500 years ago, before European settlers arrived, much of the Coastal Plain of what is now North Carolina and the southeastern Atlantic seaboard caught fire every few years and burned. Ignited by lightning, blazes swept across hundreds of miles of longleaf pine forests in late spring and summer, burning unchecked until rain, rivers or wetlands halted the fires.

Contrary to what you might have learned from Smokey the Bear, this was not a disaster. In fact, this large-scale burning of the landscape was necessary for maintaining the vast longleaf pine forest ecosystem that covered southeastern North America. But not just any fires. Today's landowners are finding that to bring maximum benefits to the longleaf forest ecosystem, spring and summer fires are best.

Unlike the loblolly pines that blanket eastern North Carolina today, the longleaf is a more fire-dependent species. During its first few years, longleaf remains in a "grass stage," protected at ground level from burning by a mantle of thick, succulent needles. Its bark is also thicker and more resistant to fire than loblolly or hardwoods. The pre-settlement burnings that scorched the landscape controlled faster growing—thus competing—hardwoods, brush and other pine species, thereby allowing a prairie-type wiregrass and native legume understory to flourish under the fire-resistant longleaf.

Without fire, this longleaf ecosystem—which covered an estimated 10 million acres in North Carolina and 92 million acres across the Southeast—could not survive. That's what happened in the 1930s, after the last of the old-growth longleaf stands were finally felled and total fire suppression became the norm in forest management.

Without fire to control competing growth, the slow-growing longleaf pine, and its complex understory wiregrass ecosystem, virtually vanished from the southeastern landscape. In North Carolina, surviving longleaf shrank to a few isolated pockets, and where natural regeneration had taken place, a policy of fire exclusion quickly destroyed the savanna grass ecosystem as hardwoods and other pines invaded the understory.

Today it's been estimated that there are about 1.8 million acres of longleaf left in the South, "none of which," says Ron Myers, director of fire management and research for The Nature Conservancy, "is self-maintaining." Losses of remaining mature longleaf, the product of the last natural large-scale regeneration that took place earlier in the century, are upwards of 140,000 acres per year.

In the latter half of the 1980s, however, and particularly during the last three years, interest in restoring longleaf pines has sprouted again (see "Looking For Longleaf," August 1988)—and so, too, has interest in the use of fire to maintain the longleaf ecosystem.

This renewed attention on restoring longleaf pine forests is today converging from several directions: from conservationists, plant ecologists and wildlife biologists interested in preserving and expanding the longleaf pine ecosystem; from commercial growers interested in high-quality timber; and from those wishing to tap into the burgeoning demand for pine straw, already a $20 million-a-year industry in North Carolina.

While the two camps remain at odds on many issues—protection of endangered red-cockaded woodpeckers is a chief example—this increased attention has the potential not only to return many remaining longleaf forests on public lands to a more natural state, but also to reestablish more longleaf forest acreage on private land and, perhaps, reverse the loss of total longleaf acreage.

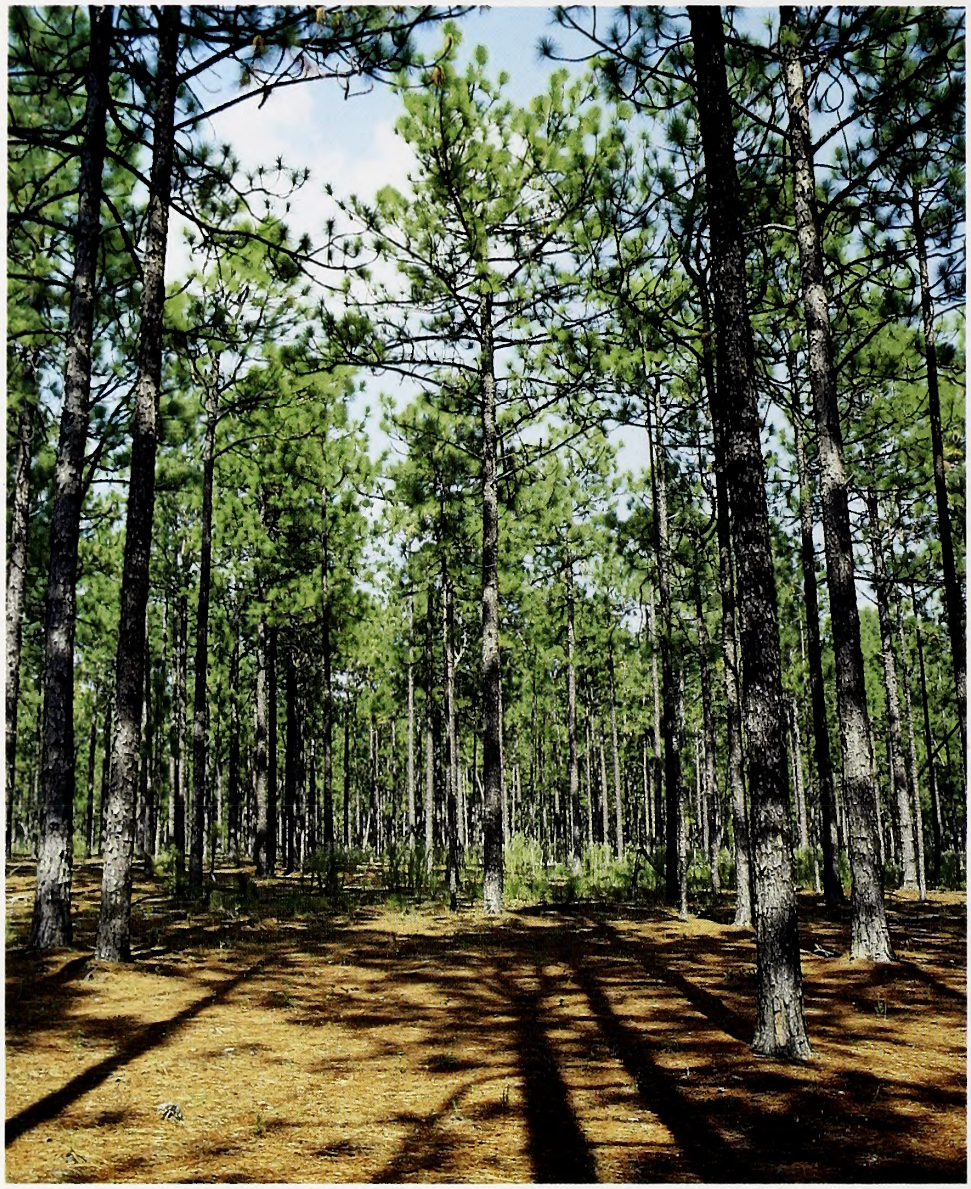
For many wildlife species, the possibility of increased use of prescribed fire, specifically the use of growing-season (or summer) burns, can only be seen as good news. Not only will summer burning help endangered wildlife species like the red-cockaded woodpecker, and rare plant species like the Venus's-flytrap and the pitcher plant, but game species like bobwhite quail and fox squirrels stand to benefit as well.

To understand how summer burning may affect the present-day longleaf ecosystem and its attendant wildlife populations, however, one needs to travel back to the early 20th century, to the days when the science of

LLOYD B. HILL

***Before the days** of fire suppression and over-cutting, much of the uplands in eastern North Carolina would have resembled this classic tract of longleaf pine savanna (left). Bobwhite quail (above), red-cockaded woodpeckers, bluebirds and Bachman's sparrows are among the birds that flourish in this now rare forest ecosystem.*

# Rethinking Fire & Forests



JANE ROHLING

***This stand will provide** an excellent supply of pine straw; however, tracts like this are of little value to most wildlife species, including quail. The dense canopy of mature trees prevents much sunlight from reaching the ground, thereby retarding growth of the grasses and herbs beneficial to wildlife.*

modern forestry was in its infancy.

By the turn of the century, 300 years of unbridled exploitation for naval stores and logging had essentially annihilated the virgin longleaf pine forests that had once covered the southern Coastal Plain. Free-ranging and feral hogs roamed much of the countryside, devouring calorie-rich longleaf pine seedlings, thereby preventing healthy large-scale regeneration. With little or no regrowth in native longleaf and a continued demand for timber, there was clearly a crisis in forestry.

Early foresters responded in two ways. First, fence laws were passed to exclude swine from the woods. Second, fires, which previously swept the countryside almost yearly, were vigorously suppressed. "The early foresters also concluded that fire was the chief culprit preventing forest regeneration," said Cecil Frost, the coordinator of the N.C. Department of Agriculture's Plant Conservation Program. "Their anti-forest fire efforts became an overwhelming mission—essentially a crusade in the level of its intensity." And because of their efforts, the pine forests did grow back—but in loblolly, slash, and pond pine, not longleaf.

Because it is prolific and produces a lighter seed, loblolly disperses and reseeds far easier than does longleaf. In the absence of fire, which will kill young loblolly seedlings, loblolly also grows much faster than longleaf and is easier to plant and grow on a commercial scale. Loblolly also matures about twice as fast as longleaf, in 25 to 30 years, thus making it popular with timber growers. Together, these attributes sealed the fate for any landscape-scale longleaf regeneration.

Ironically, about the same time that total fire suppression became the 11th commandment for most foresters, Herbert Stoddard, a young naturalist working in Georgia, began preaching what amounted to a blasphemy of the blackest order. In the mid-1920s, Stoddard had come to the Thomasville area in south Georgia to investigate why bobwhite quail populations were plunging on quail plantations in the area. The quail plantations in south Georgia and northern Florida, owned mostly by wealthy Northern sportsmen, were some of the few areas left in the South that still held vast tracts of virgin and old-growth longleaf pine.

Through controlled burning experiments, Stoddard found that the bobwhite was a "fire bird," as he called it, "so closely (was) it linked ecologically with fire in the coastal pinelands." Like many other species, bobwhites were dependent on the native grass ecosystem found under the open longleaf canopy; the grasses provided the bird excellent nesting cover and native legumes made for plentiful food.

The best way to restore quail populations, Stoddard concluded, was to restore burning. This did not sit well with the anti-fire fundamentalists. "At one time I was classed by many as an enemy of these forests," Stoddard wrote in his book *Memoirs of a Naturalist*, "because of my written and spoken insistence that the pine forests not only could be burned over frequently enough to maintain their natural vegetation and associated wildlife but indeed should be burned for the safety and healthy development of the forests themselves. As the most outspoken advocate of controlled burning in coastal plain pine forest, I became the focus of that controversy."

However, after much acrimony, Stoddard and other fire proponents like E.V. Komarek eventually prevailed. In 1943, the U.S. Forest Service gave general approval for the use of prescribed burning in woodlands.

In large part the techniques adopted

JANE ROHLING

JANE ROHLING

***This mixed pine/hardwood** forest (above) is an excellent, and very common, example of a tract that has been burned infrequently. It may also have been burned only in winter, a practice that does not kill all the intruding hardwoods. The open savanna (left), by contrast, provides a good example of an area that has been burned frequently in the summer. Prescribed burning from April to September mimics the time that fires usually burned before European settlement.*

# Rethinking Fire & Forests

JANE ROHLING

***One week after a prescribed** growing season burn, many of these turkey oaks are dead or dying, while fire-resistant longleaf pines survive. Once the hardwoods are eliminated through repeated burning, the grass ecosystem will begin to return. Fires actually help germinate many of the seeds of native grasses and legumes, and they also increase the seed reserve of the plants that flower and bear fruit after a burn.*

during that time—grudgingly at that—were primarily late-winter burns. The cooler weather and higher humidity generally made controlled burning easier and more predictable, and early biologists believed nesting quail populations might be incinerated. (Some nests will be burned; however, quail will renest).

The use of late-winter burns in longleaf was certainly far better than no burning at all. It controlled the hardwood understory to some degree, allowed for some longleaf regeneration and was also applicable to loblolly pine management such as keeping woodlot fuel loads under control.

But Stoddard's and Komarek's continuing research, conducted in the 1950s, '60s and '70s at a former quail plantation, the Tall Timbers Research Station in northern Florida, also showed that late-winter burning didn't really mimic the role of fire in nature. "In pre-settlements days, the fire season was the lightning season, which typically started in April and ran until September," explained Cecil Frost. "Growing season burns approximate the natural fire regime to which native birds, animals and plants are adapted."

Researchers also discovered that cool-season burns were actually creating an entirely different ecosystem from what they thought they might be getting. "Over the years, repeated cool-season burns often converted an open longleaf pine savanna into a longleaf pine/turkey oak forest," Frost said. "Winter burns or early spring burns may kill hardwoods stems above ground, but the plant still has a full complement of carbohydrates stored in its roots, and new sprouts are produced as soon as spring arrives. Fires in summer, on the other hand, catch hardwoods at their lowest ebb in terms of stored carbohydrates and many are killed outright."

Although the values of growing-season burns were becoming increasingly apparent by the 1970s, getting them implemented in the field was another matter. The voice of Smokey the Bear—"Forest Fires Kill"—still hung heavy over forest management and, in many circles, the use of prescribed fire continued to be viewed more as a necessary evil than as an essential component of longleaf pine forest management.

But in the late 1970s and early 1980s, several things happened. State governments in the Southeast began natural heritage programs dedicated to the recovery of rare and endangered wildlife. The Nature Conservancy, a noted private land preservation group, began implementing growing season burns on suitable properties in the Southeast in an attempt reestablish the longleaf/wiregrass ecosystem. After a court case, regulations concerning the federally endangered red-cockaded woodpecker—which does not tolerate hardwood understory intrusion—were becoming more strictly enforced by the U.S. Fish and Wildlife Service, thus mandating a more active management strategy on national forests, as well as on other federal and state-owned lands.

Simultaneously, there was, and is, a growing interest from the private sector for restoring longleaf, driven in large part by increasing demand from landscapers for the pine straw —of which about 90 percent comes from longleaf pines. To effectively rake pine straw, the hardwood understory must also be eliminated—for which growing-season burns are perhaps the most effective technique.

The increasing profitability of pine straw raking, combined with frequent, light thinnings (shelterwood cutting) of mature longleaf, now means that growing longleaf can become a money-making venture. Fred White, section chief of forest management for the N.C. Forest Service, estimates longleaf growers can realize an annual 8 percent composite rate of return from a properly managed shelterwood/pine straw raking operation.

In sum, the renewed interest amounts to what Cecil Frost calls the "Great Awakening" in fire ecology. "There was a long gestation period from the time researchers were learning about growing-season fire ecology to actually getting it out in the woods," Frost said. "It's only been in the last five years, and, particularly, in the last three years, that we're seeing a move toward more and more summer burning."

On public or federally owned lands, efforts are already under way to restore remaining longleaf pine stands to a more natural state by hardwood removal and increased summer burning. For instance, at the Sandhills Game Land near Southern Pines, one of the largest tracts of remaining longleaf in the state, the N.C. Wildlife Resources Commission has begun increased burning on the 57,000-acre area. "This will improve both red-cockaded woodpecker and bobwhite quail habitat," says Terry Sharpe, the small-game project leader for the Wildlife Commission. Currently we've got about 2,100 acres in the summer-burn program. By the end of the 1990s, I'd expect to see much more acreage under this fire regime."

On private lands, the restoration of longleaf forests and summer burning still remains problematic. The fast-growing, easy-to-plant loblolly remains the tree of choice for many foresters, land owners and timber companies —and will likely remain so. Longleaf is harder to grow and takes an estimated 10 years before producing pine straw. For private landowners, controlled burning takes time, money and effort and is not feasible in some areas of the state due to air pollution restrictions. There's also a growing sensitivity about smoke, especially around areas experiencing rapid population growth. Finally, many landowners are apprehensive about potential restrictions placed on timbering and development should red-cockaded woodpeckers take up residence in a stand of old-growth longleaf. "I believe it is an error to be overly concerned about the restrictions red-cockaded woodpeckers may have on a landowner wishing to plant longleaf," said White. "In the 40 years it will take for a planted longleaf forest to become attractive to woodpeckers, the birds will have either recovered, gone extinct, or the regulations will have changed."

The increasing demand for pine straw raking is not without controversy also. "Pine-straw raking depletes legumes, the most beneficial herbs for wildlife, along with many other species in the herb layer," writes Frost. "There are also important questions about its effect on soil fertility and tree growth caused by the removal of nutrients."

On the other hand, if restrictions are placed on straw raking on some public lands, it could create a powerful financial incentive for private landowners to begin growing longleaf stands and managing them with summer burns. "An important point to make," Frost said, "is that many biologists aren't opposed to pine straw raking per se. If someone wants to grow a stand of longleaf and set up pine straw-raking operations on private lands, that's fine. There is, however, concern about the effects of heavy raking on remaining natural longleaf ecosystems on public lands. It's part of the problem of managing the 1 percent of remaining longleaf landscape for 100 percent of the biological diversity once found in the vast forests."

Today we know that fires will never again sweep unchallenged over hundreds of miles of longleaf pine savanna each year. But like a tiny spark smolders until it bursts into flame again, the increasing awareness of growing-season burns and their benefits promise to make at least some properly functioning longleaf ecosystems more than just a memory. ☐

*Permits are necessary for controlled burns in North Carolina. For more information, contact the N.C. Division of Forest Resources, P.O. Box 27687, Raleigh, N.C. 27611-7687.*

DERRICK HAMRICK

***Growing-season burns** in longleaf ecosystems are necessary for managing red-cockaded woodpeckers. These burns eliminate the hardwood understory that encourages predators and competitors of the federally endangered woodpecker. Most burns conducted in a savanna ecosystem are patchy and low in intensity.*

# Deer Hunter's Dawn

## By artfully blending into the trees for six hours, can a hunter reclaim an honorable place in the food chain?

by Eddie Nickens ©1992
illustrated by David Williams ©1992

Like a thought creeping into the back of my mind, the predawn chill seeps through my body. On the walk here through the woods I broke a sweat, and the clammy dampness that lies against the small of my back oozes into my arms and legs. I begin to shiver, and I hold my jaws apart so my teeth can't rattle. I must let the woods awaken undisturbed, my footsteps forgotten, my presence unfelt.

It is like this always, each morning that I hunt. Just as the black night melts away into dawn and the trunks of nearby trees take form in the darkness, the temperature plunges, and an eerie breeze blows, as if the coming day must chase the reluctant night away.

So I shiver. My nose itches, and I move my one ungloved hand to scratch it doubly hard, knowing that in daylight I must resist the temptation to move. Spindles of spiderwebs netted my face and hair earlier as I walked around the lake, crossed the cove creek where the Canada geese raised a brood last summer, skirted the hardwood bottom and hiked up a finger ridge to this pine tree where two woods' trails cross, one skirting the thicket that lies 30 yards away, the other leading from the thicket to the deep woods.

I shift my weight, and the cold metal platform creaks. I sit on a tiny webbed stool 15 feet from the ground, my bow across my knees, an arrow nocked to the bowstring. Dawn approaches. I am as still as the woods that sleep around me.

The sun has yet to show, but its rising paints the eastern sky with glowing reds and yellows, and already I can see the ground below. The path to the thicket is a narrow trough that runs beeline-straight out of the bottom and into the cutover. A dogwood tree, with berries already turned crimson, marks the spot where the trail disappears into the brambles, through an oval opening like the door of a giant cartoon mouse hole. Within this shelter the deer will sleep during the day.

The trail that runs around the thicket is more wandering, dipping below ridges and around rock piles made when long-ago farmers cleared the fields where the woods now grow. On the other side of the copse, a stand of second-growth pines towers over furrowed ground. In late summer, mushrooms push through the carpet of pine needles here, and deer and squirrels feed heavily, leaving only moist crumbs and holes in the ground litter. But it is November now, and I am betting on late-season acorns to draw the deer to the hardwood bottoms.

The early breeze has died, leaving my scent to rise above the forest floor and the sharp nose of the white-tailed deer. I have walked too far into the woods to hear car doors slam as early risers make their way to work—but the sound of an occasional tractor trailer's whining wheels reminds me of the road I left behind.

In the distance a barred owl mourns its eternally unanswered question—*Who cooks for you? Who cooks for yooou now?*—followed by a second haunting hoot and . . .

Cripes, that was close! A third owl answers from just a few feet away, startling me. I flinch and drop an arrow. It sticks into the ground below. The great bird flies past me from its roost, on wings whose soft, near-silent whoosh is rarely heard until too late.

Shafts of sunlight creep across the leaves like the glimmer from a roller-skating rink reflecting ball. For 20 minutes or more I've heard the tiny chirping of the seed eaters—the finches and buntings and sparrows and tough-guy towhees that kick among the leaves like tiny kung fu artists. Now they are joined by whistling warblers, high in the tree canopy, who've waited for the sun's warmth to bring out the aphids and ants and assorted creepy-crawlies they relish. For more creatures than myself, the hunt has begun.

This is the tough part. After an hour of forced stillness, tree knots grow into my spine, a cough crawls to the edge of my throat and deer-hunter's doubts seep into my mind. Was I quiet enough on the walk in? Have the deer caught my scent? Am I silhouetted against the bright sky? Will I be seen if I scratch my nose—just this once, very, very, slowly?

*Whassat?* I almost hear a hushed whisper in my ear. *Whassat? Do you hear something?*

*Taptap. Tap. Tap.*

The noise comes from behind me, from below the slight rise that made me think twice before choosing this stand. A deer could slip behind that swell and pass me unseen, I thought—but this trail in front was so clear, so worn.

*Tap. Taptap.*

Could be a squirrel. *Tap. Tap.* Could be a deer. *Taptap.*

I pull on the cord that snakes under my arm, and bring the deer call into reach. I breathe into it, almost a sigh, emitting a single gravelly grunt.

U-r-r-r-r.

Nothing. I wait, holding my breath, willing my heart to cease its throbbing in my chest.

Nothing. There is nothing there.My pulse rate subsides, leaving in its wake a leaden weight in my arms.

I once missed a deer up in the head of Durham County, and the resulting buck fever hit me like a rush of adrenalin gone bad. I was high in a tree in the woods next to a corn field, glassing the distant corner, when a small group of does suddenly skittered from the trees behind me, making as much racket in the dry leaves as teenagers in a record store. I slowly turned and searched behind them, sure I'd find a trailing buck, nose to the ground, love on his brain. There were, in fact, two—a small spike and a forkhorn. I twisted around, pulled the big Hawken rifle to my shoulder, settled the sight on the forkhorn's chest and pulled the trigger.

And then I began to shake. Not just my hands, but my arms and my legs and my torso. My teeth chattered so hard they hurt, and my entire body shook till I had to set the big Hawken rifle against the tree trunk and hold on to a limb.

When I'd recovered enough to climb down and walk to where the buck had stood, there was no sign of a hit. No blood or cut hair. Just a faint vision of a weaving gun barrel, and a tawny shape leaping through black smoke and sparks. A clean miss.

But there is nothing in the woods below me now, and I drop the call tube. Sweat beads up on my forehead, and I rub my temples, pulling away fingers smeared with camouflage paint.

I wait.

The sun is much higher now, a harsh white orb in an autumn blue sky. Overhead, an enormous flock of starlings, grackles and cowbirds streams southward. For nearly 10 min-

utes the birds fly in an unbroken wave, a ribbon of raucous cackles and grunts 75 yards wide, rolling toward the far horizon. Three hours have passed since I climbed my tree, and not a single deer has shown. I am hungry and tired; my eyes are dry, my eyelids heavy. Earlier I dozed for a few minutes and woke to the sound of leaves crackling below. A bobcat padded through the woods, unaware of my presence above him.

A few feet below me and a dozen yards away, a squirrel sleeps in the crook of a tree. Through my binoculars I can see its tiny chest rising with each breath, and then—I swear—a tiny squirrel yawn.

*Tap. Taptap*

Here we go again, I think. But not for long; the sleeping squirrel is up on little squirrel feet, chattering at the invader—another bushytail that promptly chases ol' sleepyhead down the tree and over the ridge and out of earshot.

I laugh out loud at their antics. Cute critters, no doubt, but no more attractive than the fox or the bobcat, whose interest in the squirrels' comings and goings has little to do with humor.

I think of last Thanksgiving dinner, when an uncle asked me how I could do it—how I could kill a squirrel or a deer or a duck. In his hand was a knife; on his plate was a bird.

There are those who do not approve. There are those who pay the butcher to do their killing for them. I prefer to do my own. I do not want to forget what the fox knows, or the bobcat—that life feeds on life. For my farm I have this forest; for the harvest I have come.

Such are my thoughts as I perch in this tree, my hands on my bow, my fingers on an arrow.

Eleven o'clock, and nothing. I am tired and hungry and November-hot. I am going home. I stand and stretch, leaning against the safety belt that holds me to the tree. I tie my pack and bow to the rope fastened to the metal platform, and let the cord slip through my hands, then swing out into the first step, groaning loudly as my sore back stretches.

Once on the ground, I retrieve my fallen arrow, slip it into the quiver, pack the safety strap and deer call, and lean against the familiar tree to catch my breath. With my lurching descent down the tree, I have broken the woods rule of stillness and quiet. I wait for the forest to forgive me with silence.

For a few hours, I'd reclaimed my place in the animal kingdom, a standing most have traded for heat pumps, drive-through windows and socially correct synthetics. As a hunter, I homestead in the world of tooth and claw, a place my ancestors once called their own.

But now I am a mere half mile from my car. With each step toward the road, I relinquish more of what I found in my tree. There I was part of the woods world, with a role as legitimate as that of the deer or the bobcat. But another world calls. As I climb the culvert and turn for a final glance, the woods doze in the midday heat, taking no notice of one man watching from the road. ⊡

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*Reprinted courtesy of the author and* Mid-Atlantic Country.

Campbell's
Campbell's
Beef Broth
BOUILLON
SOUP
Tomato
SOUP

MELISSA McCAW

# *Vittles in a* VACUUM

## When necessity dictates that you eat out—way out—here are some ways to make it a memorable feast.

written by Eddie Nickens © 1992

Opening Day morning, a half-hour before legal light. I've broken a sweat setting out the decoys—mallards dabbling in the open water to the right, teal resting in the stump flat to the left—and a brisk predawn breeze finds its way through my hood. Time to reach for my Dewar's.

Oh, no. Not my *flask* of Dewar's, but my *Dewar's flask*, the 19th-century invention known in the 20th century as the vacuum bottle. Inside is a robust mix of tomato soup and rich bouillon, laced with garlic and oregano. It's just the ticket to stoke my fires for the cold hours ahead.

Ever since Dr. James Dewar invented the double-walled glass flask around 1872, the vacuum bottle has been required equipment on any outdoor excursion where the mercury falls below the 40-degree mark. The good Dr. Dewar, later dubbed Sir James Dewar by a British king, no doubt got good and bloody tired of shivering in the grouse pit and concocted the steam-and-mirrors contraption to keep liquid gases cold enough to remain liquid. Silly fellow. He should've skipped the science lesson and headed for the patent office, because the thermos bottle in the last century may well rival the ubiquitous McDonald's burger in the number of units sold. Thermos—a registered trademark brand name—has sold so many that its name has become generic; however, there are many other companies that also make various types of vacuum bottles these days.

***Eddie Nickens** (left) whips up a delicious hot meal that he and his companion, Ken Taylor, will carry afield in one or more vacuum bottles. By noontime, both will be glad they had more than the traditional hot coffee.*

In my opinion, it's time to break the stereotype of the vacuum bottle as a lowly coffee bearer. The venerable vacuum bottle of the 1990s is far more versatile than its early brethren. With steel innards and an outer shell, today's vacuum bottle can take any punishment dished out by a duckboat or 4x4. And in the last few years I've learned to fill my vacuum bottle to the O-ring seal with everything from hot spiced juices to venison stews. Today, I even have dueling vacuum bottles: a standard issue for hot drinks as well as a wide-mouthed version for the chunky soups and stews with which I've warmed my wader-clad soul.

The idea behind the vacuum bottle is simple enough. Dewar constructed a bottle with double walls separated by a vacuum, with silvered surfaces inside and out. The vacuum negates heat loss by convection, the double walls minimize heat loss by radiation, and today the plastic cap and outer skin shuts down heat loss by conduction. It's a virtual physics grand slam of insulation.

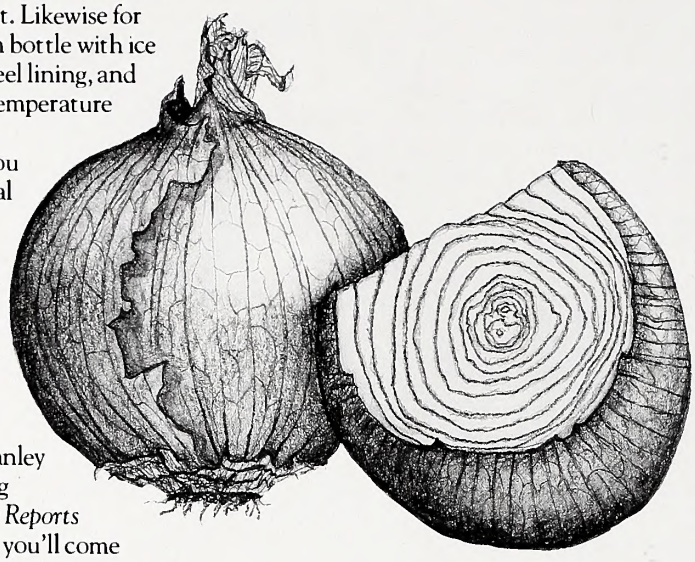
Still, a few contraptions are as simple to use as the vacuum bottle, though there are a few tips to keep in mind. Most important is not to scrimp on your selection. A *Consumer Reports* study of vacuum bottles pitted 16 models against each other in tests for thermal efficiency. The best and worst performers were separated by a near 40-degree difference in coffee temperatures after four hours. Shocking statistics!

Today, there are vacuum bottles with wide mouths, even vacuum bottle jugs for larger quantities of soups and stews. But my advice is to buy only a vacuum bottle with a tougher outer hide and a stainless steel inside bottle, not the el cheapo, and easily broken, glass bottles you filled with chocolate milk in the second grade. If you're filling the vacuum bottle with hot foods or liquids, add boiling

hot water to the bottle and let it stand for five minutes before pouring it out. Likewise for cold liquids—fill the vacuum bottle with ice water, let it cool the inner steel lining, and you'll maintain the desired temperature for much longer.

That's about as fancy as you need to get with the technical aspects of a vacuum bottle, but not so with what goes inside. While few things can beat a slug of hot java on a frosty morn, a few that can are described below. Once you take a new look at your trusty but slightly rusty old Aladdin Stanley 943C (registering a surprising "mediocre" in the *Consumer Reports* insulation Olympics), I'll bet you'll come up with a few of your own vacuum bottle entrees.

But forget about starting up a restaurant. I've already got the franchise.



## *Lee's 'Mater Mix*

*Now that I'm married, my wife won't let me make this odoriferous brew in the kitchen, so I'm forced to prepare it on an old Coleman stove in the basement. For several years this has been a duck blind staple, and it'll warm a trigger finger faster than a grease fire. But don't let the heat scare you off; this is a satisfying, filling soup while you're waiting for that 9:30 a.m. mallard flight. I have to credit my duckin' partner Lee Davis with this one; he passed along the recipe after sampling it years ago on a Knotts Island hunt. I added the green pepper, basil and red pepper flakes because it makes me look like I know what I'm doing.*

INGREDIENTS:

1 can tomato soup
1 can beef bouillon
½ garlic clove, minced (or powder to taste)
1½ teaspoons oregano
1 teaspoon basil
¼ cup green pepper, minced
Black pepper to taste, then another good shake or grind
Red pepper to taste
Tabasco (Enough, Lee told me, "to slap you around but not hurt you much.")

Easy enough: mix all the ingredients, let simmer for 15 minutes, or long enough to get your decoys untangled. Do not administer near open flame.

## *Dawn Patrol Pintos*

*Jake Parrot taught me how to hunt ducks. He also convinced me to eat pinto beans for breakfast, and I haven't yet figured out which is the crazier endeavor. Still, for years we hunted a tiny peninsula on Jordan Lake we dubbed "Pinto Point," and to this day I smell ham hocks whenever a flight of ringnecks whistles by in the dark. Since then I've doctored up our original version. Granted, it's not French toast, but I've not had a duck blind partner yet who would stop at just a taste. But careful now, the day is long, and your waders airtight. Just a little dab'll do ya.*

INGREDIENTS:

2 cans pinto beans
½ cup beer
1 large can tomatoes
1 large, chopped onion
1 tablespoon lemon juice
1 tablespoon chili powder
Salt and pepper to taste

Mix all ingredients and simmer for a half-hour or so to reduce the liquid. You're good to go. When you crack open your vacuum bottle in the morning, you might want to hold it pointing away from your eyes, champagne style. Powerful stuff!

## *Rocky the Fryin' Squirrel Stew*

*This isn't the all-day recipe your grandmother used to make, but I'll put my vacuum-bottle variety of Brunswick stew against anybody's, anytime. This one's based on information begged from a cross section of barbecue houses across the state, and it's a welcome treat during a cold day afield. If you're not a squirrel hunter, substitute chicken for the squirrel meat, but by doing so you're shaming the proud history of Brunswick stew. And don't let the long ingredients list fool you; this one's easy. As written, it makes one big bucket of stew, but it freezes very well, so you'll have enough left over for your daughter's wedding reception next summer.*

INGREDIENTS:

4-5 cleaned squirrels
2 large onions, cut in large chunks
2 14-ounce cans of whole, skinned tomatoes, quartered
1 bell pepper, cut in large chunks
1 potato, cut in ¼-inch cubes
¾ cup Marsala wine or cooking sherry
10-ounce package of frozen lima beans
10-ounce package of frozen okra
1½ cups kernel corn
2 chili pepper pods
1 cup garlic-seasoned croutons
1 teaspoon rosemary
½ teaspoon thyme
Salt, pepper to taste
4 cups water
Bacon fat or butter

Quarter cleaned squirrels and place in large pot or kettle with enough water to cover. Parboil until tender, at least an hour. Remove the squirrel pieces, debone, and brown in bacon fat or butter. (I've even smoked my squirrels for a more distinctive flavor, then deboned.)

Add browned squirrel meat to pot and all other ingredients except for the lima beans, okra, corn and croutons. (The wine or cooking sherry is a crucial ingredient, so important you might want to add a little extra in case your measuring cup is out of tune.) Bring to a simmer and cook 30 minutes. Add water if necessary. Add the lima beans, okra and corn, simmer another 20 minutes. Fill up the vacuum bottle, toss in the croutons and try to make it till noon.

ILLUSTRATED BY KIMBERLY K. CHEEK

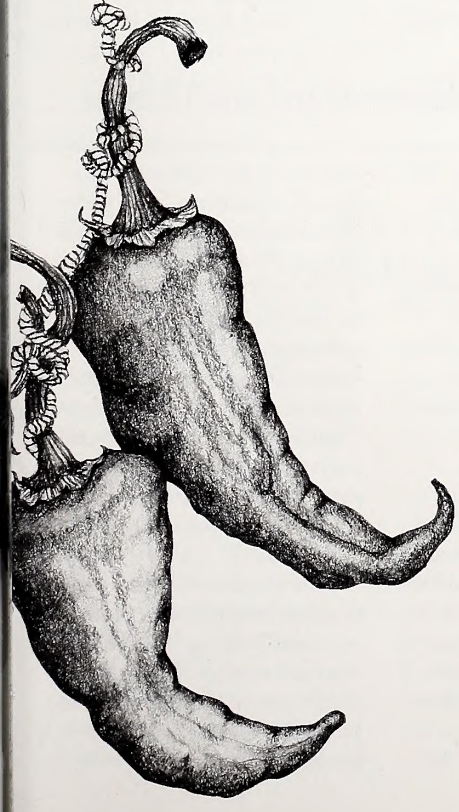
## Many-Spice Venison Stew

*Why wait for a special occasion to treat yourself to the bounty of the field? Venison stew, a hunt staple, isn't just meant for end-of-the-season beast feasts. The Indians ate the heart of their prey for strength; a little venison stew for hunt-camp lunch just might be what you need for the afternoon stand.*

INGREDIENTS:

1 to 1½ pounds venison, cubed
½ cup port wine
½ cup teriyaki
Bacon grease
Flour
2 medium onions, sliced
1 tablespoon rosemary
2 bay leaves
1 tablespoon basil
1 teaspoon tarragon
Miscellaneous cut vegetables: carrots, potatoes, mushrooms, etc.
Black pepper, to taste

Marinate venison in port wine, teriyaki sauce and black pepper. Roll in flour, and brown venison in bacon grease or butter with the sliced onions. Place in deep casserole dish, add remaining ingredients, and cook at 350 degrees for three to five hours.



## Wassail

*Every winter, 18th-century colonists would wander through the apple orchards, beating on the trees to drive the evil spirits from the fruit. Crazy Englishmen—thought the world was flat, too. Today we all know apples come from the grocery store, so we don't waste our time breaking branches. But I've got to hand it to the colonists—they sure knew how to brew one spiritual elixir, named for their wacky whacking. I'll give you the unleaded version for hunt camp, and even without the oomph of apple brandy and whiskey, this is a smooth drink guaranteed to blunt winter's blasts.*

INGREDIENTS:

1 gallon apple cider
2/3 cup sugar
2 teaspoons whole cloves
2 teaspoons whole allspice
2 3-inch cinnamon sticks
2 oranges studded with cloves

Heat all ingredients, cover and simmer for 20 minutes. Crumpets and tea sandwiches optional.

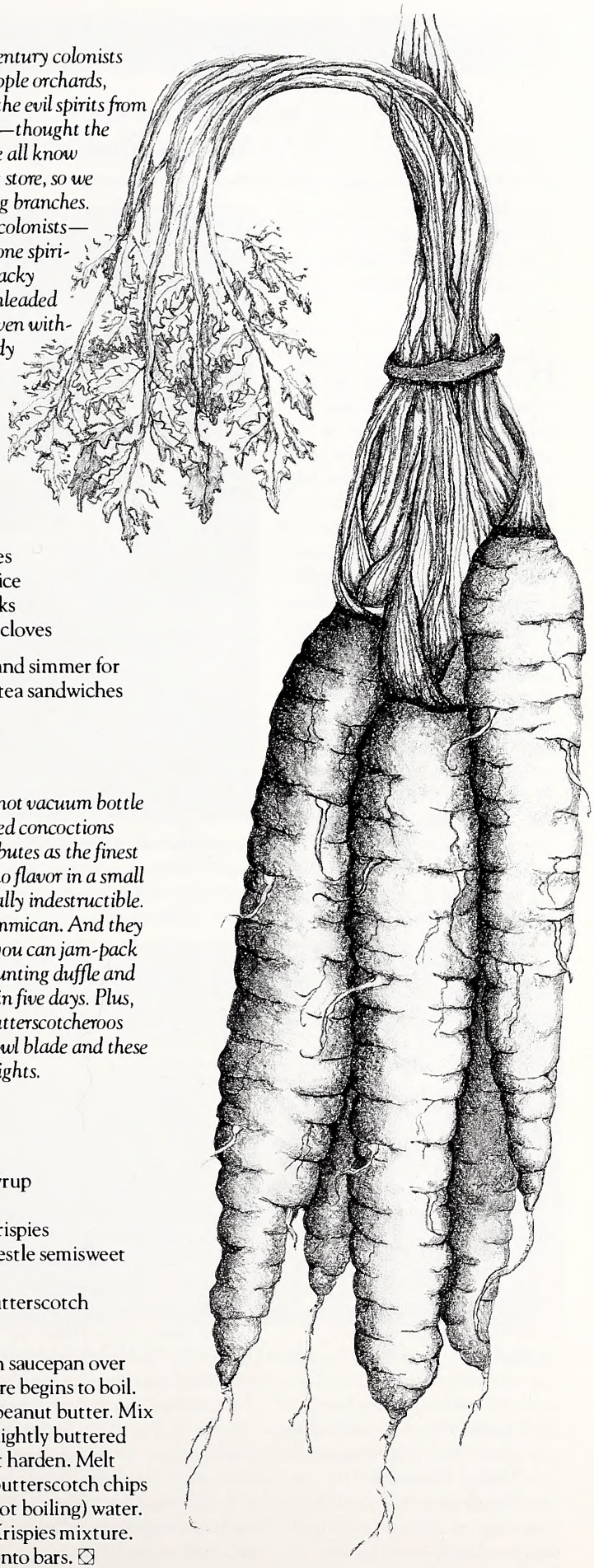
## Butterscotcheroos

*Okay, okay, so they're not vacuum bottle food. Still, these sugar-shocked concoctions share many of the same attributes as the finest vacuum bottle entrees: mucho flavor in a small space, easily packable, virtually indestructible. Kinda like 20th-century pemmican. And they are tough—in a freezer bag you can jam-pack these in any corner of your hunting duffle and rest assured they'll be edible in five days. Plus, drill holes in the middle of butterscotcheroos with your Swiss army knife awl blade and these guys can double as decoy weights.*

INGREDIENTS:

1 cup sugar
1 cup Karo light corn syrup
1 cup peanut butter
6 cups Kellogg's Rice Krispies
16-ounce package of Nestle semisweet chocolate morsels
16-ounce package of butterscotch morsels

Combine sugar and syrup in saucepan over moderate heat, until mixture begins to boil. Remove from heat. Stir in peanut butter. Mix in Rice Krispies. Press into lightly buttered 13-inch by 19-inch pan. Let harden. Melt semi-sweet chocolate and butterscotch chips in double boiler over hot (not boiling) water. Stir to blend. Spread over Krispies mixture. Chill until top is firm. Cut into bars. ☒



*Summer Breeding Success Appears Mixed*

# Survey Shows Quail Season Poor Last Year

*Written and Edited by Vic Venters*

For bobwhite hunters across the state, the 1990s did not begin on a good note. Quail hunting success declined significantly in both Piedmont and Coastal North Carolina last year, as measured by the N.C. Wildlife Resources Commission's 1990-1991 Avid Quail Hunter Survey. The drop in the Piedmont comes after two years of improving populations there.

Overall, last season was the worst on record since 1984, when the Wildlife Commission first conducted the survey to measure quail-hunting success and flush rates from avid quail hunters around the state. Last year, 138 avid quail hunters from 79 counties contributed data from over 2,500 hunts.

Last season, hunting parties averaged harvesting 48 birds per season, a drop of 41 percent from the 74 birds taken per season the previous year. The average flush and harvest rates declined about 20 percent in the Coastal Plain and 25 percent in the Piedmont.

The number of coveys found per trip in the Coastal Plain declined about 21 percent to about 2 coveys located per trip. In the Piedmont, the number of coveys located per trip fell 30 percent to about 1.6 coveys. Statewide, the average bag per hunt declined to 2.6 birds, down from almost 3.9 birds in the previous year.

As for the coming season, biologists reported mixed breeding success for bobwhite in the state. "I've been getting better early reports from counties along the coast," said Terry Sharpe, the Wildlife Commission's small-game project leader. "It looks like we had a good early summer hatch there. However, in the inner Coastal Plain and Piedmont the reports of early hatch birds have been more spotty."

"We also had our usual July drought through much of the state, so that's not good for young bird survival," Sharpe elaborated. "And then we had unusually heavy rains in August, especially in parts of eastern North Carolina. That may have drowned birds breeding down in wetlands areas."

Bobwhite populations normally fluctuate from year to year. However, quail populations in North Carolina, and the entire Southeast, have been locked into a long-term, 30-year decline thought to be caused largely by changing land-use patterns due to modern agricultural and silvicultural techniques.

N.C. WILDLIFE RESOURCES COMMISSION

***As measured by the Wildlife Commission's Avid Hunter Survey,*** *North Carolina quail hunters fared poorly last year, with success down in both the Piedmont and in the Coastal Plain. Bobwhite populations have been declining across the Southeast for about 30 years, with habitat deterioration thought to be the main culprit driving the declines.*

## Blaze Orange Extends to Small Game

Small-game hunters in North Carolina should remember that wearing blaze orange is now mandatory. The 1991 state legislature passed a law requiring anyone hunting quail, rabbit, squirrel, pheasant and ruffed grouse to wear a fluorescent-orange garment that is visible from all sides. The orange garment can be a hat, vest, jacket or pants, as long as it is visible from all directions.

Blaze orange is not required for hunting turkey, waterfowl or migratory game birds like doves, woodcock, rail and snipe. Nor is blaze orange required when hunting foxes, bobcats, raccoons or opossums.

The law is an addition to the blaze-orange requirement for big-game hunting. "The widespread use of blaze-orange has almost eliminated hunting deaths and accidents attributable to another person being mistaken for game," said Capt. Wilton Pate, head of the Commission's hunter-safety program. "Small-game seasons run concurrent with portions of big-game seasons, so this new law should help make the woods safer for all."

The law does make an exception for people hunting on their own land, stating "this section does not apply to a landholder, his spouse, or children, who are hunting on land held by the landowner."

*Camouflage Helps, Too*

## Deer Stands Useful for Bird Watching

Who says hunting and bird watching aren't compatible? Some of the best wildlife observers are or were hunters—James Audubon, for example.

Modern waterfowl hunters have to be able to instantly identify various duck species on the wing to determine whether to shoot or not. Waterfowl marshes also teem with a variety on non-game birds—gulls, herons, hawks and egrets—affording the naturalist hunter a superb viewing.

As an avid birder and deer hunter, I've discovered that one of my favorite places to observe birds is from a tree stand. From September through January, deer hunters spend many hours perched 15 to 20 feet above the ground on stands. This places you up in the branches among various birds, or above ground-dwelling species like bobwhite quail, thus allowing easy observation.

On many hunts, a deer is never seen. On days like this, I've enjoyed watching birds like Carolina chickadees, cedar waxwings or Carolina wrens. I've seen wood ducks buzz by at eye level and bluebirds perched within two arms length.

Birds most often view a well-camouflaged stand hunter as just another odd growth on a tree. Even keen-eyed species like red-tailed hawks or great-horned owls will get so close you'll think they might land on your head. Redbellied woodpeckers and yellow-shafted flickers often climb the tree just above or below stand hunters. Fall is also an excellent time to watch for hawk migrations, especially along the coast or near mountain ridges. I've seen several hundred hawks in situations like this.

Hunters who are interested in learning more about birds should consider taking one of the small pocket bird-identification guides up in the tree with them. A pair of compact binoculars helps with identification, too.

Even birders who don't hunt might want to consider buying a tree stand and learning how to put one up. Deer-stand birding is a great way to spend a day outdoors observing the wonders of nature, whether you carry a pair of binoculars, a rifle, or both.

*—Howard Vainright, River Park North Supervisor, Greenville Recreations & Parks Dept.*

*Alcohol Still Big Killer*

## Boating Deaths Drop Statewide

Although North Carolina's waters are becoming more crowded each year, boating accidents and deaths from boating-related accidents decreased in 1991. Twenty-six people were killed during 1991 in 166 accidents, compared with 37 fatalities in 198 accidents the preceding year—even though almost 4,000 more boats were registered in 1990.

Alcohol was a factor in eight of the fatal accidents, weather was second claiming six lives, while operator inattention caused four deaths. Overloading and excessive speed were factors in two of the fatal accidents.

Boaters are urged by the Wildlife Commission's Enforcement Division not to consume alcoholic beverages while boating, to avoid excessive speeds, to wear personal flotation devices, and to be alert at all times in an effort to further reduce accidents and fatalities on North Carolina's waterways.

*—Bodie McDowell*

*Forbush Team Wins Third Title*

## North Carolina Wins Safety Tournament

Forbush High School's Hunter Education Team became a "threepeat" performer when it won the North American Youth Hunter Challenge for the third straight year. The latest win came this summer in Raton, New Mexico, when Forbush defeated second place Louisiana by 330 points in the hunter safety tournament sponsored by the National Rifle Association.

Teams are scored not only in shotgun, rifle, muzzleloader and bow and arrow contests, but also on compass reading, wildlife identification and hunter responsibility. The Hunter Education Program in North Carolina is sponsored by the N.C. Wildlife Resources Commission.

Three members of the Forbush senior team have been on a national championship squad for five consecutive years. The three-times national champion team members are Jason Petree, Jason Poindexter and Michael Doub. They, along with Richard Eaton, Chad Matthews and alternatives Brad Hillard, Jason Long and Eric Ridings made up the 1992 championship team. Forbush seniors are coached by David Moxley.

Petree, Poindexter and Doub were members of the Forbush junior teams that won national titles in 1988 and 1989. Forbush teams were the first ever to win the junior and senior titles in the same year. Another first came during the recent national event when Jason Petree of the Forbush senior team and younger brother Luke of the junior team won the high overall titles in their respective divisions.

The top three teams from the state's annual Hunter Education Tournament advance each year to the national event. State champion West Davidson and Currituck High were the other Tar Heel senior teams, while Fall Creek and Perquiman's Team Number 3 were the other junior teams.

*—Bodie McDowell*

MELISSA McGAW

***Forbush High School's Shooting Team** again took top honors for the third straight year at the North American Youth Hunter Education Challenge safety tournament held in Raton, New Mexico. Pictured (from left to right) are: Larry Doub, assistant coach; David Moxley, coach; Jason Poindexter; Brad Hillard; Jason Petree; Eric Ridings; Michael Doub; Chad Matthews; and Captain Wilton Pate, hunter safety coordinator for the N.C. Wildlife Resources Commission. Not pictured are Richard Eaton and Jason Long.*

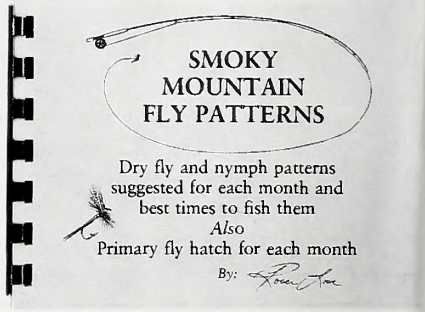
*Book Review*

## Smoky Mountain Fly Patterns

Smoky Mountain Fly Patterns *by Roger Lowe. Self-published, Roger Lowe, 210 Sunnyside Road, Waynesville, N.C. 28786, (704) 497-3113. Laminated, hatch charts, 15 pages, 1991. $5.*

This pocket-sized fly pattern book is dandy for trout fishermen who like matching the hatch on streams in southwestern North Carolina and southeastern Tennessee. Although it's arguably true that exact fly patterns aren't nearly as important for success in the Appalachians as angler stealth and a proper presentation, picking the right fly can, at times, be important on many streams, especially those that are heavily fished.

Lowe's booklet consists of charts that show on a month-to-month basis the primary dry fly and nymph hatches typically taking place during that time. The author suggests the artificial flies and nymphs needed to match those hatches and the appropriate hook sizes needed. He also includes some useful tips on tactics—such as the best times of day to fish—appropriate for each month.




The author, a fly tyer and trout angler of 25 years, researched the hatches primarily on the streams in and around the Great Smoky Mountains National Park. One note: *Smoky Mountain Fly Patterns* is not illustrated nor is it an entomology guide—but, then, it's not designed to be. Anglers unfamiliar with some hatches and flies would do well to supplement their reading with illustrated fly pattern books. The booklet is also small, will fit in a vest pocket and is waterproof—"fisherman friendly," in other words.

### Field Notes

| | |
|---|---|
| Eastern Gun Deer | Closes Jan. 1 |
| Central Bow and Arrow Deer | Closes Nov. 7 |
| Central Muzzleloading Deer | Nov. 9-14 |
| Central Gun Deer | Opens Nov. 16 |
| Northwestern Bow and Arrow Deer | Closes Nov. 23 |
| Northwestern Muzzleloading Deer | Nov. 16-21 |
| Northwestern Gun Deer | Opens Nov. 23 |
| Western Bow and Arrow Deer | Closes Nov. 21 |
| Western Gun Deer | Opens Nov. 23 |
| Black Bear | See *Regulations Digest* |
| Wild Boar | Closes Nov. 21 (first season) |
| Gray Squirrel | Closes Jan. 30 |
| Fox Squirrel | (Only in 18 Counties) See *Regulations Digest* |
| Quail | Opens Nov. 21 |
| Rabbit | Opens Nov. 21 |
| Ruffed Grouse | Closes Feb. 27 |
| Raccoon and Opossum | See *Regulations Digest* |
| Snipe | Opens Nov. 13 |
| Mourning Doves | Nov. 23-28 |
| Rails, Moorhens and Gallinules | Closes Nov. 13 |
| Ducks, Mergansers and Coots | Nov. 26-28 (middle season) |
| Brant | Nov. 26-28 (middle season) |
| Snow and Blue Geese | Opens Nov. 2 |
| Sea Ducks | Closes Jan. 20 |
| Swan (by permit only) | Closes Jan. 30 |

Information on bag limits, either-sex hunts, permits and other regulations may be found in the *1992-93 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest*. For a copy, check with license agents or contact the N.C. Wildlife Resources Commission.

*Active on Southeast Coast*

## Local Conservancy Marks Anniversary

One of North Carolina's most effective local land conservancies celebrates its 10th anniversary this year. Founded in 1982, the Northeast New Hanover Conservancy is dedicated to the preservation and enhancement of the 18 square mile area covering the northeast section of New Hanover County.

This area includes all of the area and water between U.S. 17 and the Atlantic Ocean with the northeast limit being the drainage basin of the Futch Creek-Foy Creek system and Rich Inlet. It extends southwest to Mason Inlet and includes the full drainage basin of Howe Creek.

In the last decade, the Conservancy has racked up an impressive string of achievements. Currently, the group owns about 1,000 acres of marsh between Porters Neck and Figure Eight Island which has been designated by the state as a primary nursery area. The Conservancy is now in the process of acquiring additional marshland.

The group has also been active in environmental-education efforts, and has set up and funded fellowships at the University of North Carolina at Wilmington to study streams and creeks within the Conservancy's focus area. Six scientific reports have been completed on streams, and another six are under way.

In the past, the Conservancy has used results from the studies to gain Outstanding Resource Water (ORW) classification for Middle Sound and Howe Creek, and to curtail high-density condo developments that would have affected coastal water quality.

"Most of the water around here remains relatively clean and provides a good habitat for marine life," said Paul Foster, the Conservancy's president. "The land isn't densely developed yet and natural vegetation and wildlife still exist."

The Conservancy currently has about 350 members and is a state chartered, not-for-profit corporation.

For more information, contact the Northeast New Hanover Conservancy, 126 Beach Road South, Wilmington, NC 28405, or call Paul Foster (919) 686-0362.

## Wildlife Endowment Fund Report

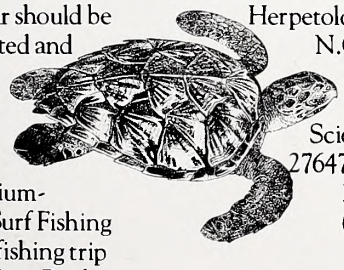
**August 1992**

Principal Balance
$17,283,095.30
Interest Earned
$10,016,648.37
Total Receipts
$27,299,743.67
Interest Used
$4,123,817.48
Fund Balance
$23,175,926.19

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement Wildlife Commission programs, the principal remains invested to generate additional interest for the future.

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact before traveling to an event. Listings for this calendar should be conservation-oriented and should be sent four months in advance.



**Nov. 6-7**

The N.C. Aquarium-Pine Knoll Shores Surf Fishing Program features a fishing trip to Cape Lookout/Core Banks, information on tackle, equipment and fish preparation. For more information, contact J. P. McCann at the N.C. Aquarium-Pine Knoll Shores, P.O. Box 580, Atlantic Beach, N.C. 28512, or call (919) 247-4004.

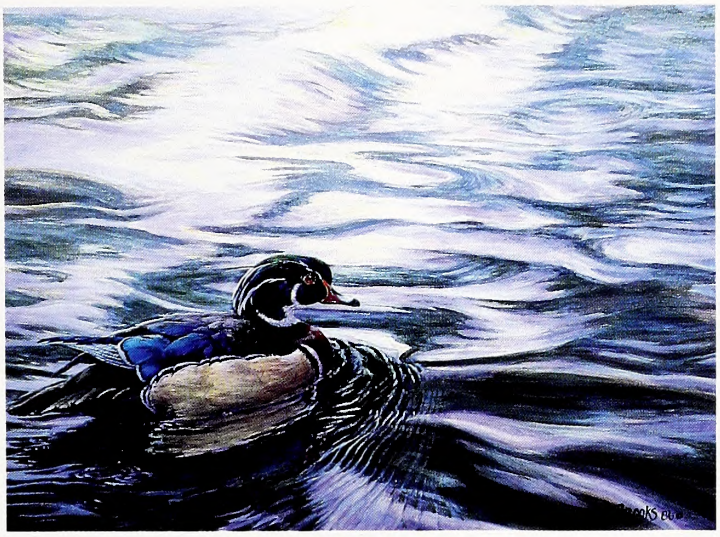
**Nov. 7**

The fall meeting of the N.C. Herpetological Society will be held on the campus of N.C. State University in Raleigh. This year's theme will center around sea turtles and other endangered amphibian and reptile species. The public is welcome. For more information, contact the N.C. Herpetological Society, N.C. State Museum of Natural Sciences, P.O. Box 27647, Raleigh, N.C. 27611, or call (919) 733-7450.

## Photographer Misidentified

In the article "Making Fire" in the September 1992 issue, author Burt Kornegay was inadvertently identified as the photographer. The accompanying photographs were actually taken by photographer Howard Hill of Cullowhee. We apologize for the error.

## The 1993 North Carolina Wildlife Calendar Is Here!



***With such artwork*** *as Brooks Pearce's "Jewel on the Water" featured above, the North Carolina Wildlife Calendar is sure to sell out again this year.*

The works of Robert C. Flowers, Jr., Brooks Pearce, David E. Doss, Robert B. Dance, Bob Herr, Duane Raver, Mel Steele, James A. Brooks, Joe Seme, and Dempsey Essick are featured in the 1993 Wildlife Calendar. Order yours today by returning the form below with your check or money order to 1993 Calendar, N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, N.C. 27604-1188.

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CALO93

# Paying to Play

*by Vic Venters*

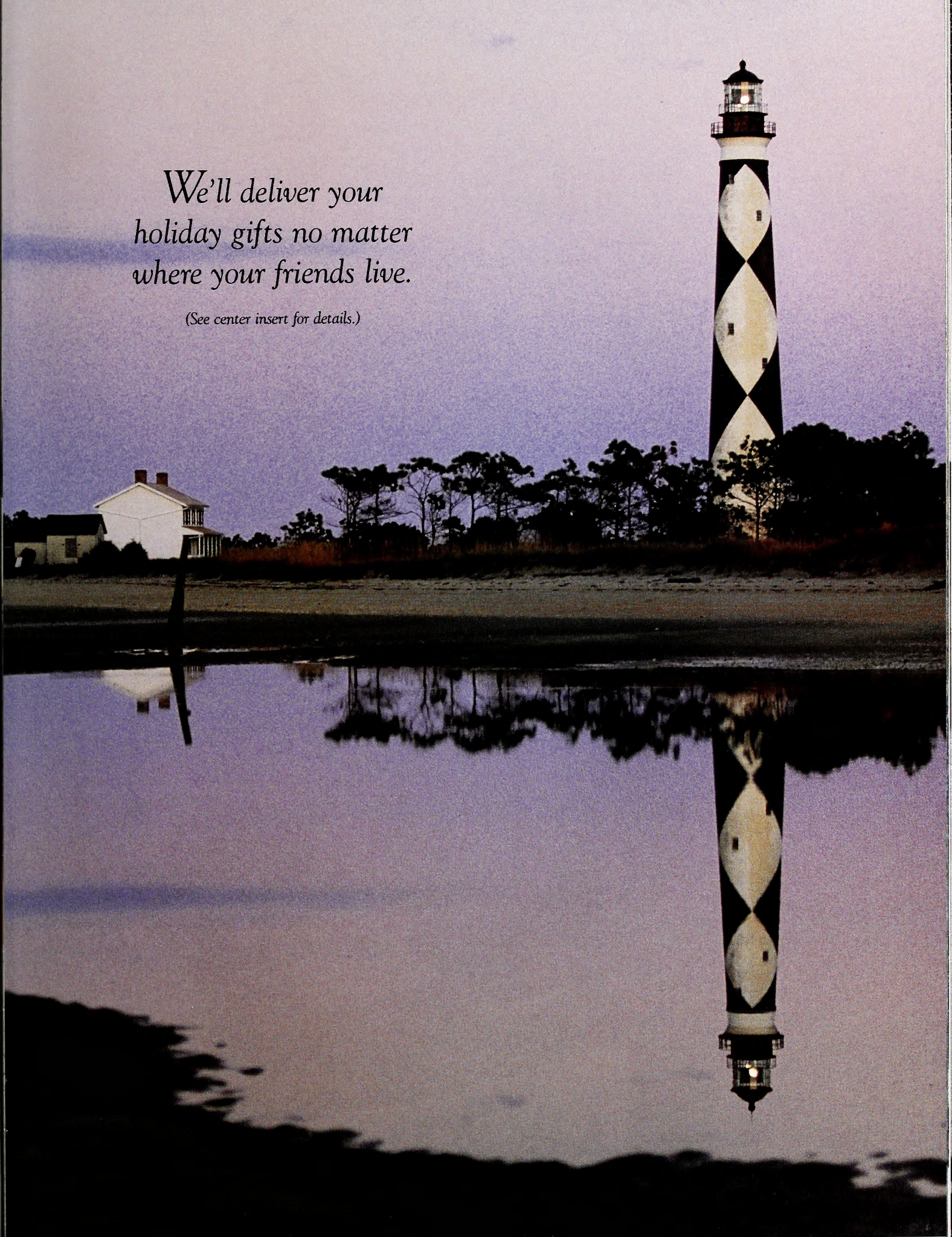
Farmers have long been asked by biologists and sportsmen to use land management practices that help preserve and improve wildlife populations on the farm. Problem is, many wildlife management practices that are good for wildlife aren't good for the farmer's pocketbook. Hence, despite everyone's best intentions, little is ever done and wildlife populations continue to decline on farms throughout the Southeast. Sportsmen, however, can improve wildlife populations, even on land they don't own, by helping defray some of the farmer's management costs.

*Cash Crops:* Sportsmen should consider paying farmers to leave several rows of soybeans or corn along unharvested field borders this fall. These standing row crops offer excellent vertical cover from avian predators, and their high-caloric, high-energy contents will help rabbits, quail and migrating birds make it through the colder days of winter. The costs for doing this, when spread among several sportsmen, will vary with the size of the farm, but the amount spent should be considerably less than what one would pay for a single day shooting pen-raised quail at a shooting preserve.

Another alternative is to help defray the costs of allowing some field borders to lie fallow. The modern practice of clean plowing up to the ditch banks or to the edge of the woods has removed much of the breeding habitat and cover needed to maintain quail and rabbit populations. Leaving a couple of tractor widths uncut along the field edge as a transition zone will result in excellent breeding cover of various native grasses and weeds. After two to three years, portions of the fallow ground can be mowed or burned to keep the vegetation in an early vegetational state.

Unfortunately, small game is no longer an automatic by-product of today's farm landscape. Quail, like corn and soybeans, are now a commodity. Until sportsmen are willing or able to pay for that commodity in some way, farm wildlife is likely to remain in short supply.

For more information on small game and farm wildlife management, write the Wildlife Commission's Division of Wildlife Management, 512 N. Salisbury St., Raleigh, N.C. 27604-1188.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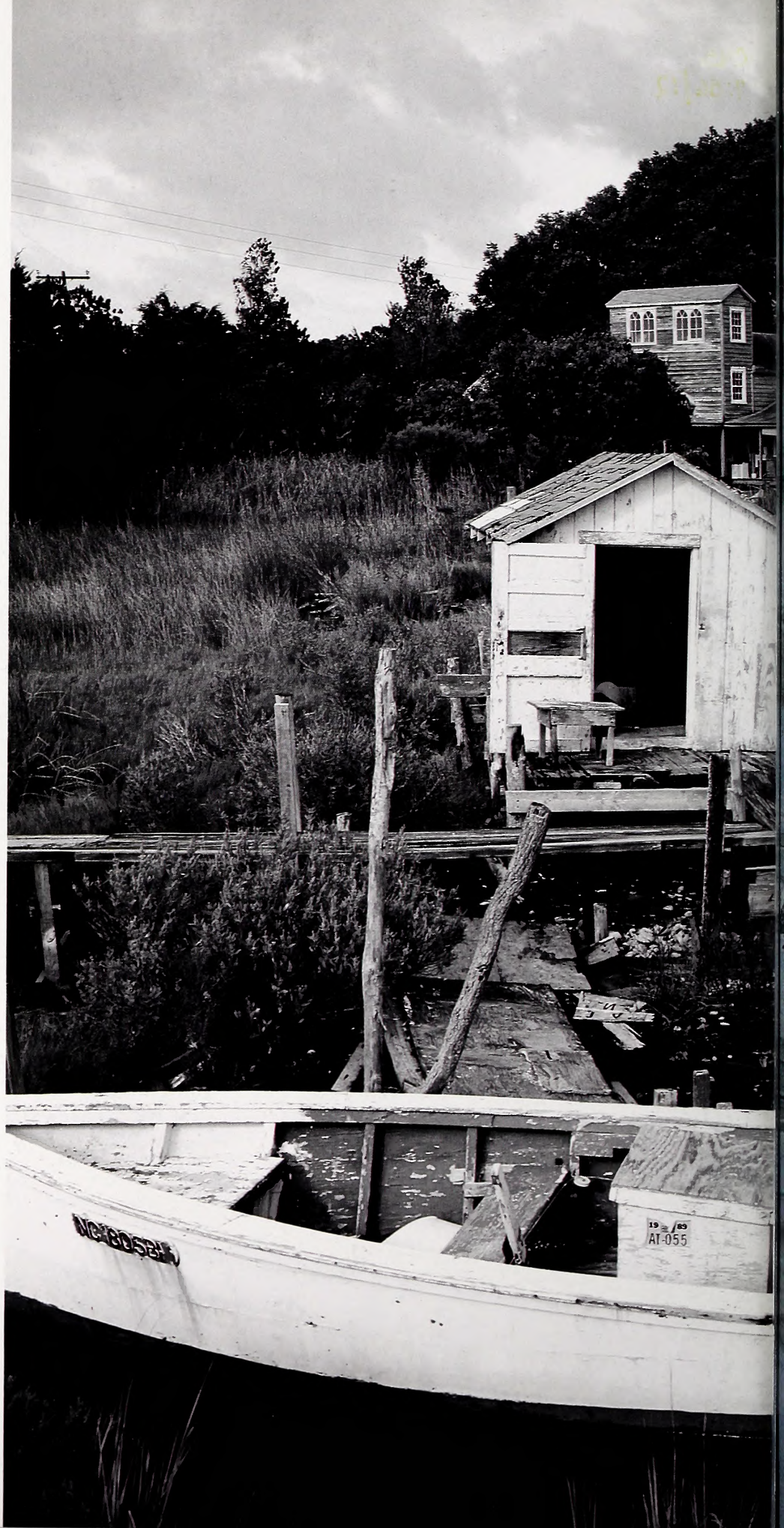
(See center insert for details.)

## Day of Rest

These wooden boats lend a wonderfully picturesque look to this coastal scene, but the peaceful ambience may be misleading. Most boats of this type are built for work, not pleasure. Only when they're too worn out, leaky and unreliable will they truly rest undisturbed, no doubt abandoned in some marsh or creek.

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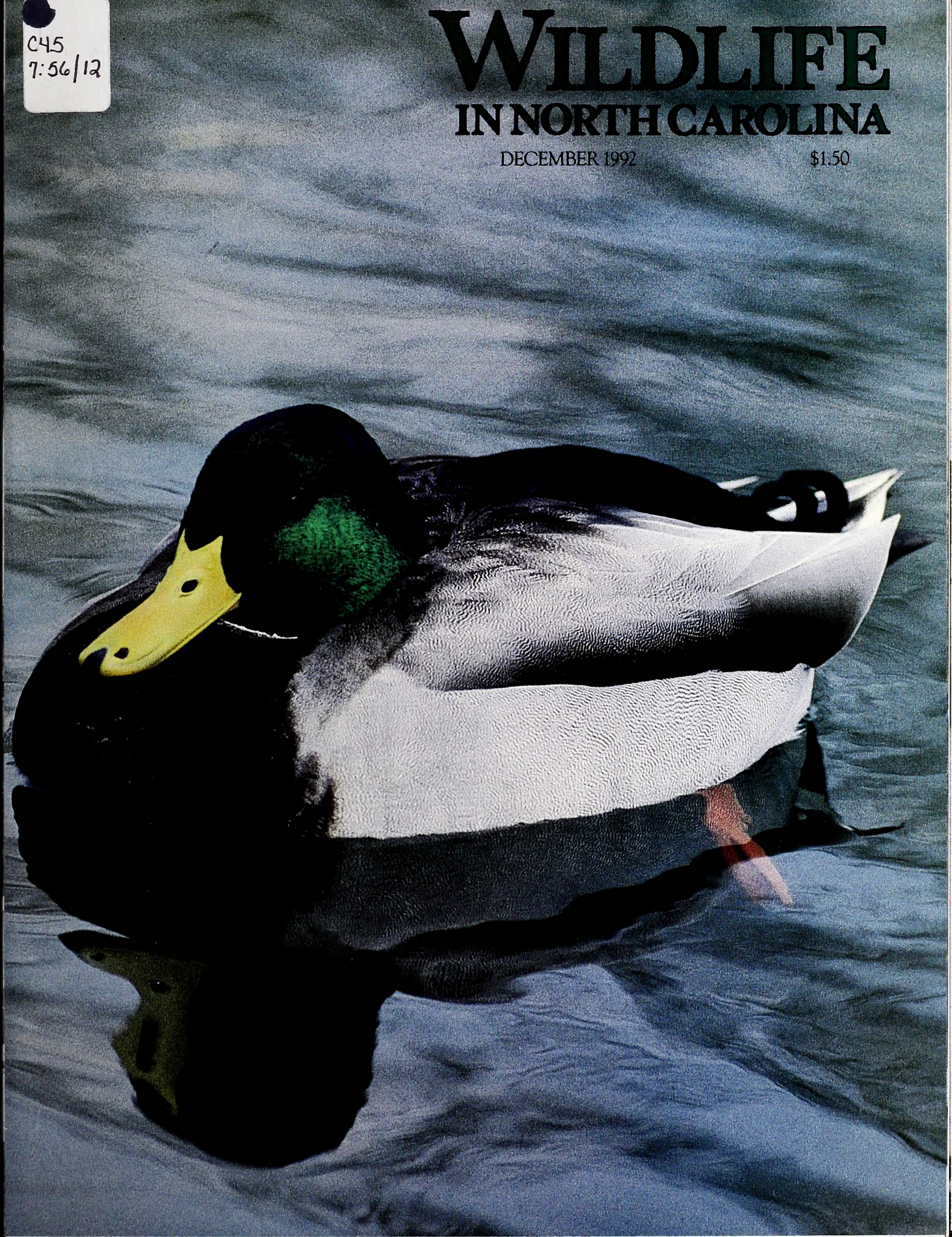
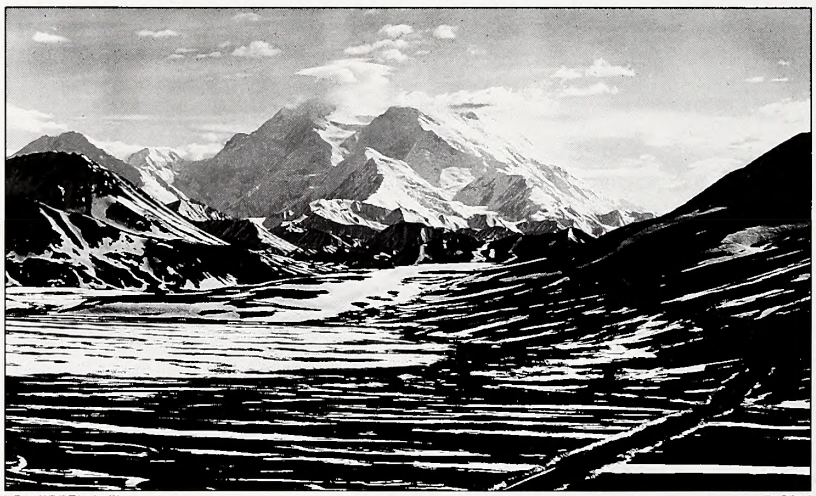


# A Taste Of Northern Exposure

*by Jim Dean*

A week in Alaska is hardly enough to form more than scattered impressions of this vast state—many that natives might rightly question—yet the temptation to pass some along is too great. This is, after all, the storied land of Nanook, Jack London and Robert Service—hard, cold, unforgiving. We celebrate its northern lights and midnight sun, sourdoughs and salmon, grizzlies and sled dogs. Can Alaska live up to all this? And what about the popular television show "Northern Exposure" set in the mythical town of Cicely, Alaska? Is its eccentric charm for real?

Seeing this last piece of frontier wilderness had been my father's dream for many years, and two years ago, he led three sons and two granddaughters north to Fairbanks. From there, we went by rail to Denali National Park, then on to Anchorage, Seward on Resurrection Bay and home. Dad and one son stayed for a second week, mostly up Copper River. So much to see and so little time, yet more than enough for a flood of images. Here are but a few.



MT. MCKINLEY, ALASKA JIM DEAN

— Fairbanks is a small city on a flat floodplain, and if you woke up in the middle of it, you might easily think you were in, say, Kinston. With our biological clocks befuddled by a summer sun that never set—and mosquitos that never stopped setting—we found ourselves wandering the streets in bright sunlight at 2:30 a.m. wondering why McDonald's wasn't open.

— Three hours north of Fairbanks, a day-trip into Minto Flats along Chatinika Creek gave us our first taste of Alaska's back country. We descended into the boggy lowlands from rolling hills forested largely in scrubby white and black spruce, the dominant trees virtually everywhere. From these hills, the distant Alaska Range looked like low, white clouds.

— Black spruce are short and scraggly, and these trees often grow on slopes at crazy angles—no two in the same direction. These "drunken forests," we were told, are caused by a temporary melting and shifting of the thin layer of soil over the permafrost which remains frozen year-round.

— On the long train ride southwest from Fairbanks to Denali National Park, we stood much of the time between the clacking cars, crossing endless bogs and relentless forests of spruce. Here and there, we passed crude signs. "These are drop points for supplies or where a wilderness family might catch a local train if the need arose," we were told.

—In June, all the rivers were snow-melt torrents of thick glacial silt that coursed down many braided channels acros wide beds of gravel or rock. From a distance, these braid looked like rivulets in a driveway, yet some were a mile wid or more. Poor conditions for trout, of course, and early fo most salmon runs, but it was fairly easy to catch graylin in small creeks. If you're serious about fishing, it would b better to wait until later in the season or hire an outfitte Still, friends we ran into had taken bush planes into bac country and caught rainbow trout up to 31 inches.

— Denali National Park—magnificently displayed in recent *National Geographic* magazine article—is huge, and w traveled six hours by Par bus on a restricted grave road from the rail statio before we caught glimpse of the centra showpiece in the Alask Range, Mt. McKinley. A 20,320 feet, it is th highest mountain i North America, its nort face the tallest shee verticle on earth. Becaus the mountain is routinel covered with clouds ever in good weather, man visitors never see it. Ye it was visible all three days we were there in record 90-degre temperatures. Bathed in soft, rosy alpenglow well pas midnight, it was hard to imagine that it has cost so man climbers their lives.

— In Denali, we were rarely out of sight of wildlife particularly caribou, but also moose, grizzly, Dall sheep and once, wolves. We photographed a grizzly sow and two cub frolicking in the dense brush on a hillside. We were cautione not to leave the bus, and had no inclination to do so. Jus beyond the gravel road was wilderness beyond imagination and at the lodge, we wore bear bells whenever we went outside "You can tell the difference between the scat of a black bea and a grizzly," we were told. "Grizzly scat has bear bells in it."

—As for "Northern Exposure," it seems surprisingly on target in many ways, and even looks authentic despite being filme in Roslyn, Washington. Alaska's people are free-spirited adventurous, well-educated and self-sufficient, and almos everyone hunts and fishes. A friend who recently attended hi son's wedding in rural Alaska says everyone wore blue jeans cooled their drinks with glacial ice and held the reception o a gravel bar while the kids caught pink salmon. As for ou family, we have vowed to return, and if our patriarch had see Alaska 60 years ago, I suspect we'd have all been born there

December, 1992
Volume 56, Number 12

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# WILDLIFE IN NORTH CAROLINA

*Wildlife in North Carolina* is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and also to the environment we share with them.

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## DEPARTMENTS

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**Nature's Ways** *by Lawrence S. Earley*

**Back of the Book** *by Vic Venters*

**Wildlife Through the Year** *by Vic Venters*

**Cover** *The mallard is one of the most common ducks found in beaver ponds and flooded lowlands along coastal river bottoms. This handsome drake is simply taking it easy. Photograph by Eugene Hester.*

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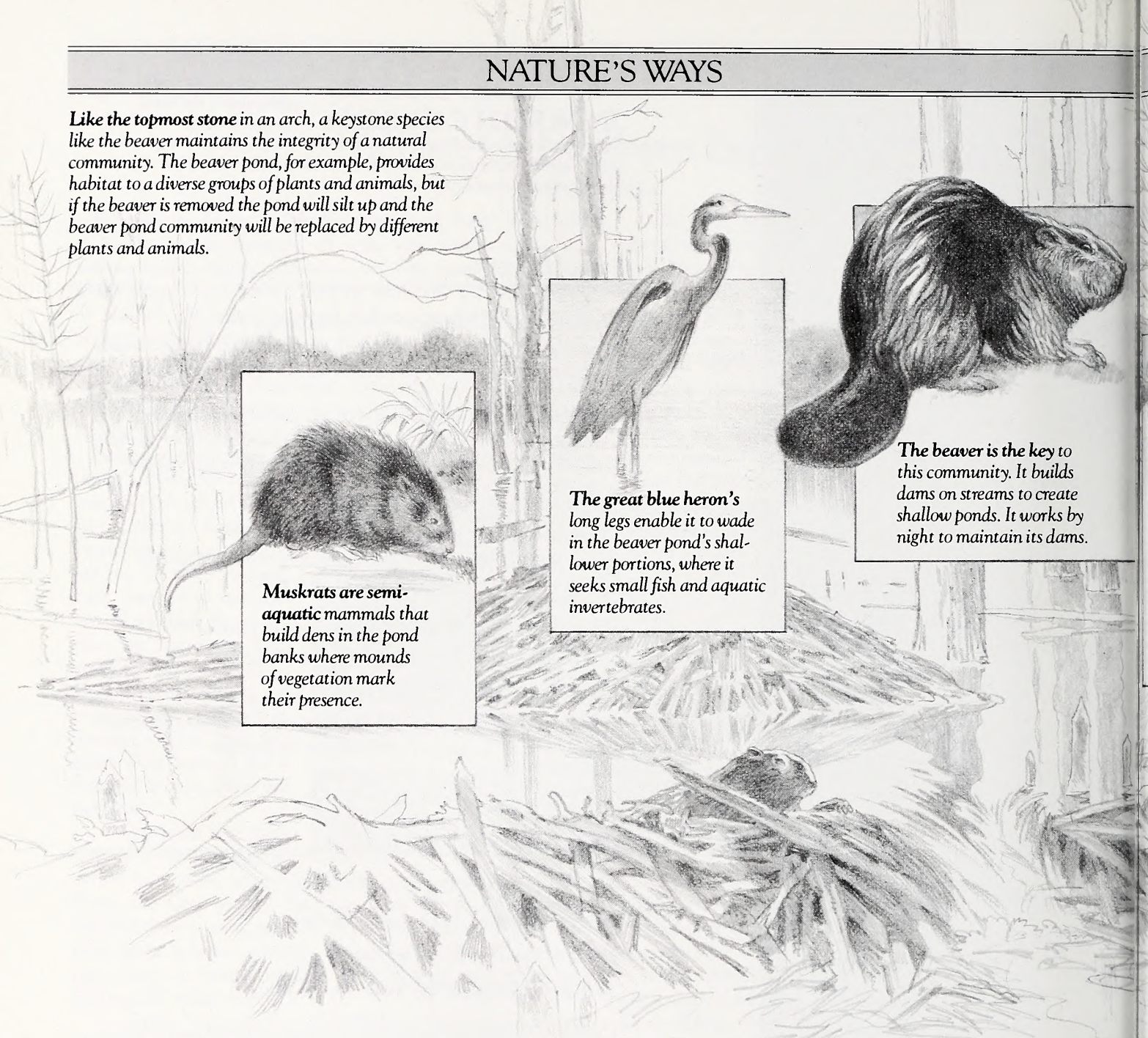


***Like the topmost stone*** *in an arch, a keystone species like the beaver maintains the integrity of a natural community. The beaver pond, for example, provides habitat to a diverse groups of plants and animals, but if the beaver is removed the pond will silt up and the beaver pond community will be replaced by different plants and animals.*

***Muskrats are semi-aquatic*** *mammals that build dens in the pond banks where mounds of vegetation mark their presence.*

***The great blue heron's*** *long legs enable it to wade in the beaver pond's shallower portions, where it seeks small fish and aquatic invertebrates.*

***The beaver is the key*** *to this community. It builds dams on streams to create shallow ponds. It works by night to maintain its dams.*

# Keystone Species

*written by Lawrence S. Earley*
*illustrated by David Williams*

By now, the idea that all living things form a web of complex relationships is a familiar ecological concept. No species, we've been taught, is independent of other plants and animals, and all of us depend upon such nonliving components of the environment as air and water.

It may seem from this that all species are equally important, and perhaps they are. Yet, some scientists are now suggesting that some species are more important than others, at least from the standpoint of maintaining the communities that they are a part of. Ecologists refer to them as "keystone" species, an architectural term that refers to the topmost stone in an arch, the very stone that holds the entire structure in place. Removing a keystone species causes the community to change so profoundly that it "collapses" and is replaced by a different community.

Though the term is controversial (some say that all species are keystone species), scientists have identified specific keystone species in several different habitats. The kelp beds in the nearshore waters of the Aleutian Islands, for example, provide cover and food for a rich community of crustaceans, mollusks, fish, marine mammals and even birds like the bald eagle. Key relationships within this community are between the sea otters that prey on sea urchins and between urchins and their preferred food—the thick strands of floating seaweed called kelp.

Historically sea otters reduced the urchin population, thus maintaining the kelp beds. But as sea otters were exterminated by excess trapping, the sea urchin populations soared and the kelp beds dwindled. Without the kelp, populations of

***The shallow waters** of a beaver pond shelter several kinds of fish, including sunfish like the bluegill. These small fish feast on aquatic insects and smaller fish.*

***Beaver ponds are full** of dead trees, yet these trees are hotels for a variety of owls and woodpeckers.*

***Beaver ponds also host** varieties of ducks and even geese, who flock to the food-rich water year-round.*

near-shore fish and animals shrank and the community collapsed. Thus the sea otter proved to be a keystone for the entire community.

Another keystone species is the gopher tortoise of Florida and other Southeastern states. This large turtle digs 30-foot burrows that are used by over 40 other species, including snakes, mammals, insects and amphibians. Overhunted as food, however, the tortoise's declining numbers threaten many of the species that depend on its burrows.

North Carolina's most famous keystone species is the beaver. This animal's controversial labors can change a fast-moving stream into a pond, attracting fish, muskrats, herons and a variety of species that prefer deeper, slow-moving water. But the beavers must constantly work to maintain the pond. If they leave or are removed, the pond will silt up and its diverse life will disappear.

Sometimes plants can be keystone species, too. In our longleaf pine communities, longleaf pine trees or wiregrass may be keystone species because they provide fuel for the low-intensity fires that maintain the open woodland. Without fire, the forest would be completely changed as scrub oaks and other hardwoods, formerly controlled by fire, outcompete the pines. Creatures that depend on the open pine forests—the red-cockaded woodpecker, fox squirrel and Bachman's sparrow—would suffer.

Out of the millions of plants and animals on earth, only a relative handful have been identified as keystone species. As a result we just don't know which species are "expendable" and which are so critical to a habitat that their removal would change it. Because we don't know, we may want to heed the advice of Aldo Leopold when dealing with natural communities. "The first rule of intelligent tinkering," he said, "is to save all the pieces."

# Ducks from a Distance

Mixed in with all the ducks and geese that normally visit North Carolina each year are some exotic species seldom seen along the mid-Atlantic.

by Eddie Nickens ©1992

I remember the first time I saw the 1986 federal Migratory Bird Hunting and Conservation Stamp that sports a single fulvous whistling duck drake staring into the distance beyond the far side of the stamp holes.

"What'n the world is that?" asked another last-minute duck stamp buyer in line at the post office, eyeing the unknown quacker with a puzzled look.

"Beats me," I said. "Looks like some merganser having a bad hair day."

Indeed, my chances of ever seeing a fulvous whistling duck on North Carolina waters is remote. But if I hunted the waters of the Texas or the Louisiana shore, I'd probably find just such a bird in my bag on a regular basis because the "Mexican squealer," as it is also known, is a fairly common duck there.

In fact, the ducks and geese common to North Carolina waters represent only a portion of the some 160 waterfowl species that range the world. But it's not just on duck stamps that North Carolina hunters and birders can see these "exotic" duck visitors. Our location at the Atlantic coast's mid-point puts us in the fringe of the northern and southern ranges of a number of interesting ducks and geese. Some of our uncommon waterfowl visitors have been

SCOTT NIELSEN

***Fulvous whistling duck***
*(Dendrocygna bicolor)*

LARRY DITTO

**Cinnamon teal**
*(Anas cyanoptera)*

SCOTT NIELSEN

***Eurasian widgeon***
*(Anas penelope)*

blown off their migratory course by unusual weather patterns. A few are displaying waterfowl's propensity to wander far from normal migration routes, and still others are just plain lost. But whatever their reasons for showing up on our shores, we welcome these wayfaring waterfowl.

**Fulvous whistling duck**
*(Dendrocygna bicolor)*

The only duck that breeds in all hemispheres, the fulvous whistling duck is still an uncommon bird in North Carolina. An abundant winter resident of east Texas rice country, the "Mexican squealer" breeds on both coasts of Mexico and winters along the Gulf Coast. It's the only member of the subfamily *Dendrocygninae*, or whistling ducks, that is a regular visitor to North Carolina. (Another whistling duck, the black-bellied whistling duck, was featured on the 1990 federal duck stamp.) Long-legged birds with a long and unusually erect neck, fulvous whistling ducks trail their legs and feet during flight, making the birds appear larger than actual size. Both hens and drakes are a nearly uniform pale reddish-brown color, hence their name.

Fulvous whistling ducks feed mostly at night, often in rice fields, to which they are accused of doing considerable damage in the Gulf states. Once called the fulvous tree duck, this bird rarely alights in trees, preferring fresh-water marsh habitat. The "whistling" part of its name comes not from its shrill, melodious calls, but from the whirring sound it makes in flight as the notched or emarginated inner vanes of the outer primary flight feathers vibrate.

In the air, watch for the trailing legs and feet and listen for the distinct whistle. In the hand, the overlarge feet and legs are another giveaway. Look for the fulvous whistling duck in late fall, on fresh-water ponds with lots of grassy cover. Top bets: the Pamlico Point impoundments, the ponds at Cape Hatteras and the Eagle Island impoundment across from the battleship at Wilmington where a small flock of fulvous whistlers showed up last fall.

**Harlequin duck**
*(Histrionicus histrionicus)*

Chances are you'll never see a harlequin duck in North Carolina, but if you do, you'll never forget it. With the size and brilliant plumage of the wood duck, the harlequin drakes sport a blue-gray body with chestnut sides. Giveaway decorations include a large white patch in front of the eye, with a small white spot and vertical stripe behind. Vertical black and white bands encircle the forward third of the body. The harlequin hens resemble the hens of some sea duck species, and are considerably more difficult to identify. On the wing, a harlequin duck may appear similar to the goldeneye, but the slate-blue body on the far North species seems dark from a distance. On the water, harlequin ducks often swim in close formation, their bodies almost touching.

In North Carolina, a few harlequins have been spotted around the Bonner Bridge for the last few years. Other possibilities include the Wrightsville Beach jetties and Fort Macon.

**Cinnamon teal**
*(Anas cyanoptera)*

In the Pacific Flyway, cinnamon teal are more common than blue-wings or green-wings, but these pretty birds are infrequent visitors to North Carolina. The only other duck with upperwing coverts of slate blue is the blue-winged teal, a common North Carolina species with which the cinnamon teal is generally found—when it's found here at all. There have been only a handful of sightings in North Carolina, the last, says Harry LeGrand, chairman of the N. C. Bird Records Committee, in 1987 on Mackay Island.

Cinnamon teal are one of the few North American ducks with a predominately red fuselage. You're not likely to confuse them with short, chunky ruddy ducks, despite similar reddish flanks. An early migrant like its blue- and green-winged brethren, the cinnamon teal remains in eclipse plumage as late as January, rendering possible identification more difficult, and this may help explain why so few are reported. "No one's ever found a cinnamon teal by looking for one," figures LeGrand. But if you see a red-bodied bird hanging out with flocks of blue-winged teal migrating through in early autumn, take a closer look.

**Common goldeneye**
*(Bucephala clangula)*

Also called "the whistler" for the wing-whistling sound made by the males, the goldeneye isn't rare in North Carolina, but it is unusual enough to warrant attention. According to *The Duck Hunter's Bible*, this brightly plumaged diver boasts a long list of vernacular names: brass-eye, bright-eye, copperhead, fiddler duck, ironhead, little diver, oyster duck, pie duck, pied whistler, sleepy diver and whistle diver. Most of those monikers have some basis in the appearance or habits of the goldeneye. Goldeneyes are the only large divers with mostly white bodies; that's your first clue. Next, look for the oval or round white jowl spot on the solid black head of the drake and, of course, the brilliant yellow eye set into the black head. The other North American goldeneye species, the Barrow's, sports a crescent-shaped marking, but you shouldn't be called upon to differentiate between the two because the Barrow's has never been reported on North Carolina's waters. Common goldeneyes reliably show up on the lower Cape Fear River, with a wintering population of 20 to 30 birds making the rounds at Fort Fisher and Carolina Beach State Park. Any of the state's ferry trips afford a chance at spotting goldeneyes.

The common goldeneye isn't shy of extremely cold weather, a behavior pattern that's earned it the nickname of "ice duck." Inland, goldeneyes favor fast water and fly singly or in small groups. On the wing, male goldeneyes show more white than any other ducks except the common merganser, another bird uncommon to Carolina waters. Tree-nesters like the wood duck, goldeneyes have been clocked at 50 miles per hour.

**Eurasian widgeon**
*(Anas penelope)*

The Old World counterpart to the common American widgeon, *Anas americana*, the Eurasian widgeon, also known as the European widgeon, has been seen in virtually every Atlantic state. The bird winters in Iceland and throughout Europe, but there is speculation that a regular southward migration of the Eurasian widgeon occurs down both American coasts in the winter, with a corresponding interior migration in the spring.

The Eurasian widgeon appears lighter on the wing than its American counterpart, with the drakes sporting a cream-colored crown and reddish head as opposed to the bright white topknot of our familiar baldpate. The hens are a tougher call; in the hand, the upperwing coverts of the American widgeon are more pale than those of *penelope*. But, says LeGrand, you can find them if you look hard enough. There are several records a year from Pea Island National Wildlife Refuge and Mattamuskeet National Wildlife Refuge. "It takes a lot of patience," LeGrand says.

***Harlequin duck***
*(Histrionicus histrionicus)*

LARRY DITTO

SCOTT NIELSEN

***Mottled duck***
*(Anas fulvigula)*

"You have to sit down with a spotting scope and pore through 500 or 1,000 Americans to find one, but Eurasian widgeon drakes stick out like a sore thumb with that gray body and red head."

To add the Eurasian widgeon to your bird list, take all your patience and a spotting scope to North Pond at Pea Island or the causeway at Mattamuskeet.

**Mottled duck**
*(Anas fulvigula)*

Though there have been no records of the "Florida mallard" in North Carolina, an introduced population of this Gulf Coast resident into South Carolina just might be the source for a future record of the mottled duck. Its habits are nearly identical to the mallard and black duck, while the appearance of the mottled duck is best described as midway between those two cousin species. In the hand, look for a very yellow bill and virtually no white border on the speculum, which differentiates the mottled duck from the mallard. Look also for the greenish-blue speculum, different from the purplish-blue speculum of the black duck.

***Common goldeneye***
*(Bucephala clangula)*

LARRY DITTO

**Common merganser**
*(Mergus merganser)*

In bird books, the range of the common merk blankets the country, but you wouldn't know it by its relative scarcity in our state. The common merganser is among the largest of all inland ducks in North America, with males averaging some 3.5 pounds apiece, but any *Mergus* sighted in the Tar Heel state is likely to be one of the common's cousins, the hooded and red-breasted mergansers.

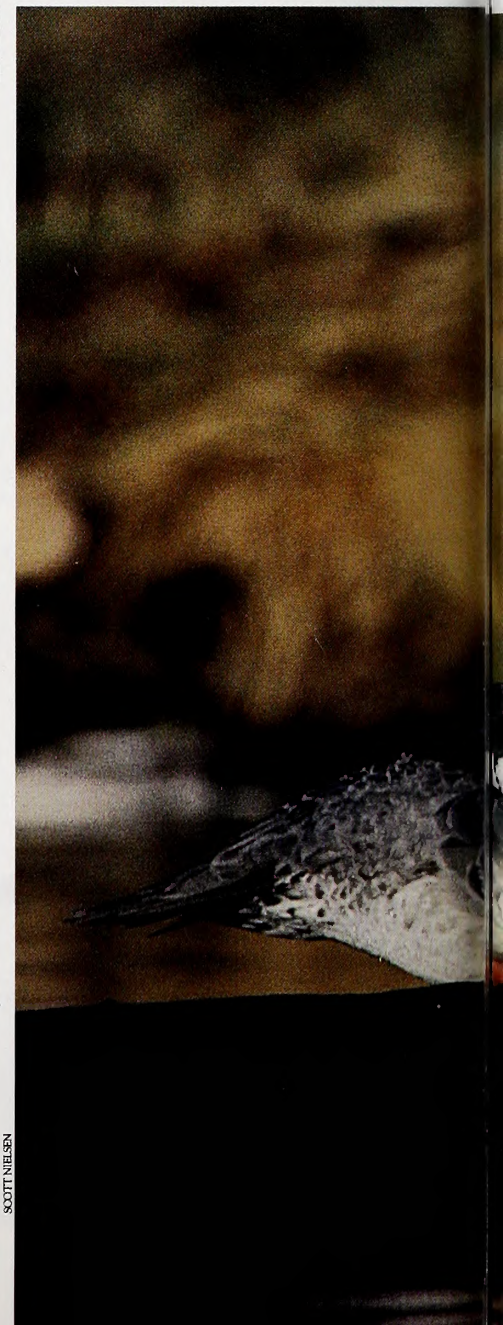
The common merganser displays all the body characteristics of its fish-eating family: the thin serrated bill, the long cylindrical body held in a straight line during flight, giving these ducks the local name "pencilneck." Like the red-breasted merganser, the common drake has a green-black head and red bill, and the body markings of the common merganser drake are similar to those of the drake goldeneye, though the two species have drastically different body profiles.

The head crest—another merganser giveaway—is visible in the male and marked in the female, which lends it the dubious distinction of being known as the "hairy-head." Also quite noticeable in both sexes is the sharp line where the brownish head and neck meet the creamy undercarriage, which helps separate the common merganser from the red-breasted merganser.

**Greater scaup**
*(Aythya marila)*

No doubt most duck hunters on the North Carolina coast can identify scaup at a glance, but how many can differentiate between the two distinct scaup species, the lesser and the greater? Probably not many.

Known collectively as "bluebills" for their wide, bluish snouts or "blackheads" for their dark heads, the two scaups have very similar body markings. Males have a dark head and neck with a white body and white underwings and a gray-brown mantle, while hens are a more uniform mottled brown, with a white face. It's a tough call on the wing, but there is one defining characteristic. Although both



SCOTT NIELSEN

scaups sport a broad white stripe on the upper wing, the stripe on the lesser scaup stops at the end of the speculum, while the stripe on the greater scaup extends from the secondaries out over the primary wing feathers almost to the wingtip. The greater scaup also seems to prefer salt water to fresh, while the lesser scaup is at home in both bays, sounds and large inland lakes. In the hand, look for the longer white stripe on the greater scaup, and pay particular attention to the sheen on the dark head. The lesser scaup sports a purple gloss, while the greater boasts a greenish gloss.

**White-winged scoter**
*(Melanitta fusca)*

Scoters and eiders are collectively known as "sea ducks," for they spend most of their non-breeding lives at sea. Scoters, which include the surf, black and white-winged, are large, black sea ducks that often zip across the ocean waves in thin, stringy lines. During the winter, all prefer the littoral zone, between the breakers and a mile out to sea.

In North Carolina's coastal waters, black and surf scoters are common, but the white-winged scoter is lesser known to birdwatchers and hunters of the shore. Black scoters are solid black except for the orange bill, while surf scoter drakes sport white head patches that gave rise to the vernacular name "skunk-head." But even easier to identify in the air is the white-winged scoter, whose white secondaries flash like identification cards over long distances. On the water, white-winged scoters are a tougher call, but adult males do sport a small white eye-slash.

White-winged scoters congregate in New England waters, where 180,000 were counted in a single winter day. They relish shellfish, and have powerful gizzards that can crush the shell of the littleneck or hard-shelled clam. Occasionally a clam will snap shut over the

***Common merganser***
*(Mergus merganser)*

SCOTT NIELSEN

***Oldsquaw***
*(Clangula hyemalis)*

tongue of a white-winged scoter, commencing a slow death by starvation.

**Common eider**
*(Somateria mollissima)*

Common in winter as far north as northern New Jersey, this bird makes North Carolina the southern edge of its Atlantic winter range. But eiders are easy to spot as they wing over the waves in a line, alternately flapping and sailing during flight. On the water, the drake common eider can be distinguished at great distances by its white mantle, comprised of a white back and black sides; its cousin, the king eider, has a black mantle. The females are a light brown, with a heavily barred body of darker browns.

Common eiders forage just beyond the surf, then move far offshore to raft up at night. Feeding around submerged ledges and reefs, these big 5-pound ducks can dive to 60 feet, using both legs and wings for propulsion, and actually can emerge flying from underwater.

**King eider**
*(Somateria spectabilis)*

Even rarer to North Carolina's coastal waters than the common eider, the king eider prefers the open ocean to the shore. These large sea ducks feed on such submarine delicacies as king crabs, sea urchins and

starfish, and have made recorded dives of up to 180 feet. The king eider is easy enough to differentiate from its common cousin while on the water, for the drake's back is solid black, as opposed to the common eider's white mantle. In the air, large white patches show on the top of each wing; common eiders display much more white on the upper wing. Get close enough and you can pick out the large orange forehead shield on an adult drake; closer still and watch for the two telltale "thorn" feathers that protrude spine-like above the wings. At any distance at all, hold your tongue in identifying females of the species, for they are similar in marking to the hens of other sea duck species.

One of the best places to spot white-winged scoters, common and king eiders, and greater scaup is from the deck of the Ocracoke to Swan Quarter ferry in winter. With the morning sun at your back, you just might be able to pick out the purple gloss on a greater scaup head; no doubt the white backs of common eiders will glisten from a great distance.

**Oldsquaw**
*(Clangula hyemalis)*

In behavior, the oldsquaw is sort of a cross between a diving duck and a sea duck; in appearance, the drake of this species, also called the "long-tailed duck" for its long tail feathers, looks like some sort of clunky cousin to the pintail. Smaller than the scoters and eiders, this bird of the Atlantic coast is hard to confuse with any other. Drakes in winter plumage appear white overall, with a black breast, face and wings. Hens are harder to identify, but the white undercarriage and whitish head with black cheek patch are still giveaways.

The normal wintering range for oldsquaws extends to North Carolina, but the birds become rarer the farther down the Tar Heel coast you go. In the air, oldsquaws are an easy call. Unlike other sea ducks, they twist and turn during their low flight over the waves, and often alight with a great splash. Old-squaws forage close to shore during the day and return to the open ocean at night, and while on the wing they warble a musical *how doodle do*. In fact, the oldsquaw's common name alludes to its talkativeness, as does its Latin handle, derived from the Latin *clangor*, meaning "noise." The sound of a flock of oldsquaws in full voice has been compared to a pack of baying hounds.

Oldsquaws are incredible divers, and have been netted by Great Lakes commercial fishermen at depths of close to 200 feet. In New York in the 1890s, a fisherman caught more than 5,000 in one haul; in 1946, a Lake Michigan netter reported catching 27,000 oldsquaws in one eight-week spring season.

LARRY DITTO

***Greater white-fronted goose***
*(Anser albifrons)*

Oldsquaws consistently winter in that part of Pamlico Sound bisected by the Ocracoke to Swan Quarter ferry, especially on that stretch of water closer to Swan Quarter, says LeGrand. They are very sporadic elsewhere, though you might want to try the rocks at Fort Fisher and the Wrightsville Beach jetties.

**Greater white-fronted goose**
*(Anser albifrons)*

The only one of the five Old World goose species with a North American population, the greater white-fronted goose is known in Europe as the "laughing goose" for its characteristic high-pitched calls. But don't look for the white front, for the common name of this goose refers to the white front of the face. Instead, consider that this is the only goose that visits North Carolina with yellow to orange legs. Somewhat smaller than a Canada goose, with a gray-brown head, neck and wings, it's also the only American goose with black bars or blotches on its belly, which lends it the common nickname of the "speckle-belly." The immature bird resembles an immature blue goose, but look for the yellow legs, a giveaway in the air, on the ground or in the hand.

Greater white-fronted geese winter in California, Mexico and along the Texas and Louisiana coasts, but one or two show up in North Carolina every few years. LeGrand remembers one bird that showed up on Lake Wheeler in Raleigh some 15 to 20 years ago. This, of course, was a freak occurrence; try looking in concentrations of geese at Mattamuskeet or Pea Island instead.

Geese are known for their relative longevity, and one speckle-belly lived to a grand old age. A young female goose in Nebraska, that was shot and wounded in 1903 or 1904, lived to be at least 46 or 47 years of age, and laid eggs annually until she died in 1950.

**Ross's goose**
*(Anser rossii)*

At about 2 feet in length, this goose is more mallard-sized, but closely resembles the snow goose with its solid white body and black wingtips. Any Ross's goose that makes it to North Carolina has come a long way: the birds breed along the Perry River in Canada's Northwest Territories. In fact, the bird was named for Bernard Rogan Ross, chief factor of Hudson's Bay Company in the latter half of the 19th century.

Almost the entire population of these geese winter in central California, but individuals or family parties sometimes mix in with snows and show up on the North Carolina coast, primarily in the newly burned fields at Pea Island National Wildlife Refuge, every year or two. In the air, it's difficult to discern a Ross's goose that has cast its lot with snows, but look for a relatively smaller bird with a smallish head and bill. While a relatively silent flight is also a defining characteristic of this small goose, it's likely individuals in North Carolina will be mixed in with rambunctious snows. In the hand, look for a bluish bill that lacks the snow's "grinning patches," black splotches along the cutting edges of the bill. ☐

# SWAMP DUCKS

## Getting there isn't much fun, but if you can arrange to be in just the right piece of flooded timber along a river bottom this season, you might be in for a treat.

written and photographed by Joe Albea © 1992

We have met adversity before in search of the greenhead mallard and the wily black duck. This morning is no different. We rise at 3 o'clock to find a quarter inch of ice on the surface of the cypress swamp. We wade into it anyway, trying to beat the first light of a bitterly cold Carolina dawn.

The darkness makes you second guess your decisions. Are you truly on the right course to the only opening in the swamp for miles around? You know the ducks will be there shortly after light, but the question at this point is, will you be there, too?

Just before the certainty of being lost sweeps over us, the next marker on a tree becomes visible. For the moment all is well as we continue to break ice and move forward. The time we spent the day before scouting and marking a path increasingly is making good sense. Without those markers we might never have made it, and certainly not on time.

After another 20 minutes of breaking ice with our knees, we can see the opening in the swamp just ahead. With barely 15 minutes before dawn, there is no time to catch our breath. That can be done after the decoys are in place.

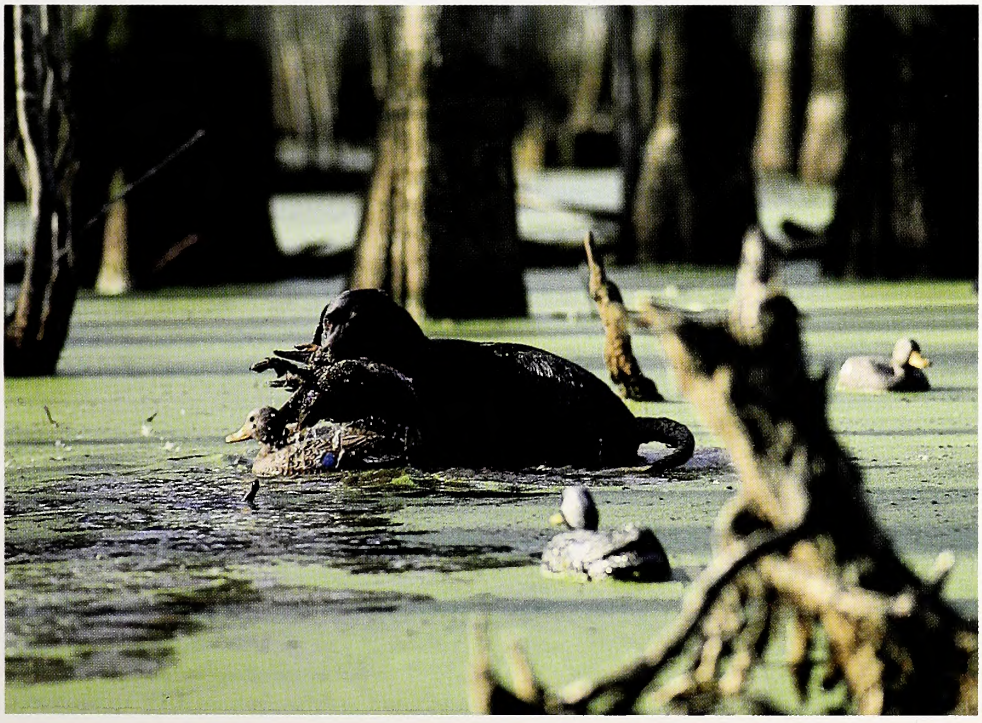
A mixture of mallard and black duck decoys are placed randomly throughout the opening. It is so cold that as soon as a decoy settles in place the ice reforms around it. We take time to check for visible decoy lines and remove any ice on the decoys as we set them out.

With 38 decoys in place it's time to hide. I take a position between two large cypress trees, while my partner, Steve Brown of Raleigh, and his black lab, Bo, settle in beside a fallen tupelo.

I'm still loading my shotgun when I hear the swoosh of wings. Six woodies pass heading for an early morning breakfast down the swamp. My last shell is in the magazine as Steve motions skyward and begins imitating mallard chatter on his call. A flock of 25 mallards responds with their distinctive feeding chuckle. Their first pass is high, but there's little question that they'll be back for a second look. Steve bellows out a comeback call that reverberates through the swamp. By now wood ducks are everywhere. Bo is shaking from excitement, impervious to the cold.

The mallards are back again, their feeding chatter indicating more than a little interest. Steve talks to them, working the call, knowing that one bad note could send the flock away. They pass at tree top level, but still we hold off. Again they swing back. While they're still 100 yards out Steve drops the call and we wait. The only sound now is the distant gabble of the approaching flock. They descend through a lone group of cypress trees, then they're in the open in front of us.

We both stand, and mallards flare in every direction. I pull on a greenhead that passes right over my head, one shot folding him cleanly. He falls just behind my stand. I have time to pick another greenhead as he passes to



***It's a tense moment** in the swamp as ducks circle the flooded pothole looking for a likely place to land (left). Skill with a duck call can make the difference in this kind of hunting. A good retriever to fetch the ducks (right) is another plus where wading is often difficult.*

***Hunters pick up their decoys*** *from placid swamp waters appropriately covered with duckweed. Flooded timber along eastern North Carolina river bottoms may be more difficult to reach than more typical hunting spots, but they offer rewards in both ducks and wild, uncrowded habitat.*

my right, but two shots fail to ruffle a feather. Steve has taken a greenhead and a black duck that happened to be traveling with the mallards. Bo has the greenhead in Steve's hand in seconds and is on the way after the fallen black duck. Bo's invaluable presence is all the more evident as I wade through 20 yards of icy swamp water to retrieve my bird.

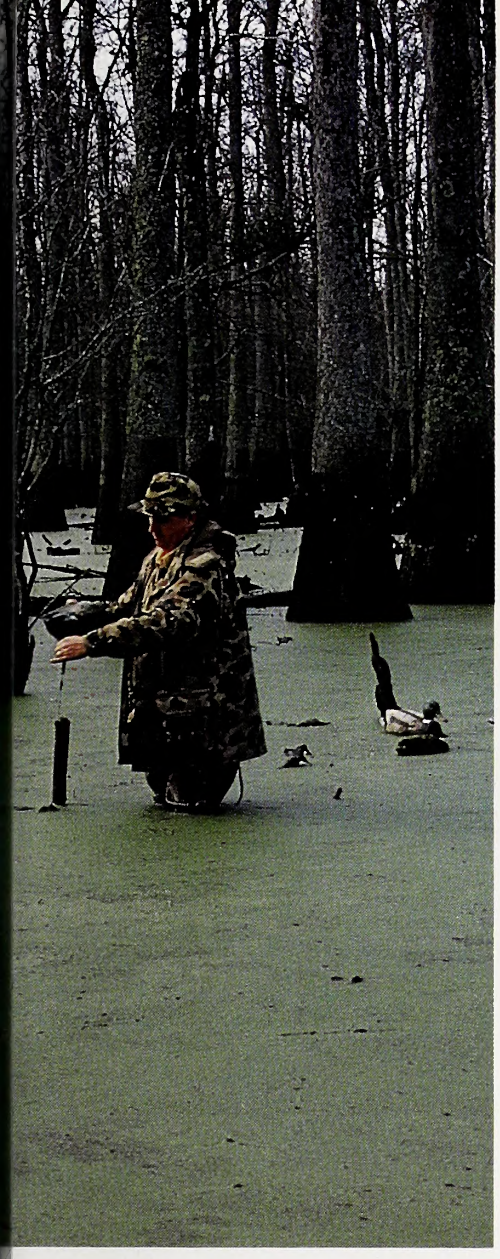
Even as Bo retrieves the black duck, the sky is filling with small groups of mallards and black ducks. Some are merely passing while others are circling, looking for a place to sit down. Our earlier shots have only momentarily shaken their resolve.

A pair of black ducks appear and though Steve has already taken his one-bird black duck limit for the day, I haven't. Steve works the call and both birds circle wide, then cup their wings. As they pass, I raise up, shoulder my gun, and watch them flare out of range. Both birds were decent specimens, but not what I was looking for. We settle down to wait, but not for long.

Steve issues an invitation as half a dozen mallards pass high overhead. Three break formation and come straight to us. As we rise to shoot, a hen flares straight overhead and I let her go. A drake slips to my left and I take him. The other bird swings in front of Steve and falls to his second shot. With both ducks in the decoys, Bo's job is somewhat easier. One of the mallards Bo retrieves is wearing a band on its leg.

So far, it's been a memorable demonstration of what a duck call can do in the hands of an experienced caller. Steve has been talking to ducks for 20 years, and he knows their language. It makes a difference with mallards and especially with the black duck.

For the next 15 minutes we watch in amazement as several hundred puddle ducks —mallards, black ducks, widgeon and wood ducks—fly over our little hole in the swamp. Most are headed elsewhere, but we manage to close out our limits—Steve with another greenhead, while I opt for a handsome



widgeon drake.

Clearly, the morning I've just described is a duck hunter's dream. It simply can't get much better, and if the truth be told, most hunters rarely find it anywhere near that good. Even so, there is something special about hunting waterfowl in swamps. It has the right look, it's by no means easy, and it can take you off the beaten path where conditions aren't as likely to be crowded. If you get lucky, you may also see some ducks, and you may even enjoy an occasional day like ours.

We were hunting one of the many cypress and tupelo swamps located along big river bottoms in the eastern part of the state. Some of these big basins along the Chowan, Roanoke, Tar, Neuse, South, Black, Cape Fear and many other smaller rivers constitute the last remaining large areas of riverine forest, and when they flood in the winter—as they often do—they afford plenty of food and many thousands of acres of secluded habitat. I could, of course, name the exact spot we were in, but then it wouldn't be secluded anymore. Given the many similar areas, you should be able to locate your own, and though it takes a bit of effort, there's more than a little pride in discovering your own secret spot.

Steve's banded duck, of course, demonstrates what waterfowl biologists already know about these big river bottom swamplands. His handsome mallard was banded on a Ducks Unlimited project in Northern Ontario and, since it was at least four years old, this was probably not its first trip to the Carolina river bottoms. Banding studies show that these are the wintering homes or stopping-off spots for a variety of ducks migrating south out of Canada and the northern states. These basins are also major nesting areas for wood ducks each spring.

Most of the ducks you can expect to see will be wood ducks, mallards and black ducks, but you may also see widgeon, greenwing teal, hooded merganser and the occasional ringneck. Pintails generally prefer open, marshy areas, but they may also drop in if the weather is really cold.

There is, however, a sad note to river swamp hunting. While many of these wooded lowlands remained relatively pristine for many years because they flood regularly, that picture has been changing more rapidly in recent years.

I have hunted a number of these swamps over the past 20 years, and during this time, thousands of acres of cypress and tupelo swamps have disappeared to increased logging for the valuable timber. Indeed, several of my favorite mallard holes no longer exist. The good news is that more recently, the logging of these wetlands has been slowed in many places by new federal laws designed to protect key wetland areas. In some cases, critical river bottom habitat has been acquired and afforded protection. In the lower Roanoke basin, for example, The Nature Conservancy, N.C. Wildlife Resources Commission and the U.S. Fish & Wildlife Service have acquired thousands of acres of prime wintering waterfowl habitat that has been traditionally protected because so much of the land was controlled by large, private hunt clubs (see "The Battle for the Roanoke Refuge," December 1989).

Ironically, the beaver has also played an increasingly important role in providing good wintering waterfowl habitat along many river bottoms of eastern North Carolina, and even in some parts of the Piedmont. Though once nearly extirpated from North Carolina, beavers have made an astonishing comeback throughout much of the state. Though not everyone is happy about this—beavers flood and kill some valuable lowland hardwoods, and have created other problems in some areas—it is nonetheless true that beavers have also been a boon for some species of waterfowl by creating more favorable habitat.

There are several ways to find good places to hunt. By using maps and doing a little perimeter scouting, you can often determine likely areas that may lie on private land owned by individuals or large corporations. Of course, you must gain permission before you venture onto these areas, but some landowners will allow entry if you follow instructions and are careful not to damage gates, roads or any natural resources. You may also apply for a special permit to hunt available state gamelands that exist along some of the river bottoms. Finally, you may be fortunate enough to be able to join a club that holds a lease on a prime river bottom wetland, or hunt with a member.

One of the nice things about hunting swamp ducks is that it requires very little equipment. You may or may not need a boat, depending on where you hunt. A pair of quality chest waders is essential, however, because you will be doing some wading, and possibly walking, in and out of the swamp. As for decoys, I prefer at least two dozen, and three dozen would not be too many on some of the more open spots. When the ducks fly over, you want them to see birds on the water.

If I consider any piece of equipment essential, it is a duck call. There is no question that a call, and the ability to use it properly, will mean more ducks in the bag. I also believe that if you cannot call, you should set your decoys and then be quiet. It only takes one strange note to flare the birds.

Your favorite duck gun should work fine in a swamp, although I usually switch from an improved cylinder choke to a modified choke because of the variety of shots I may encounter. Some days the ducks drop right in while on other days it's strictly pass shooting. With steel shot now mandatory, your choice of shot size is even more important. I personally shoot No. 4 magnum steel shot in a 2¾-inch shell, and this works fine in most situations. There are shots that I have taken with lead in the past that I will not take with steel. You have to know your limitations. A wounded duck in the swamp is often a lost duck unless you have a darn good retriever.

As with any duck hunting, it's always important to know the area you're planning to hunt. Scout it thoroughly and learn the quickest and safest route to your hunting area. Mark the trail so you can make your way in and out in the dark. With proper planning and a little cold weather, a swamp can afford some of the finest duck hunting you will experience in North Carolina. Of course, it all depends on how well we protect and manage this valuable wintering habitat, and that's something every waterfowler needs to keep a close watch on.

# Winter's Lace

Like so much of Nature's intimate canvas, some of the most delicate brushwork is on display when few are there to see it.

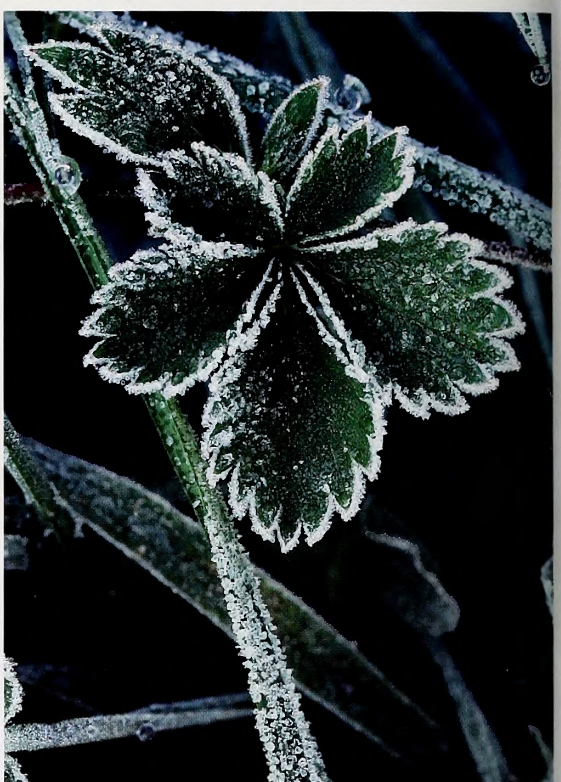
photographed by Tim Black © 1992

Sugar Maple Leaf

*Jack Frost has left an icy corsage behind*
*to mark his passage.*
*Imprisoned in lacy filagree, wild flowers and fallen leaves*
*take on a chilly splendor, if only for the moment.*
*Before the warming rays of*
*the sun, such beauty is fleeting.*

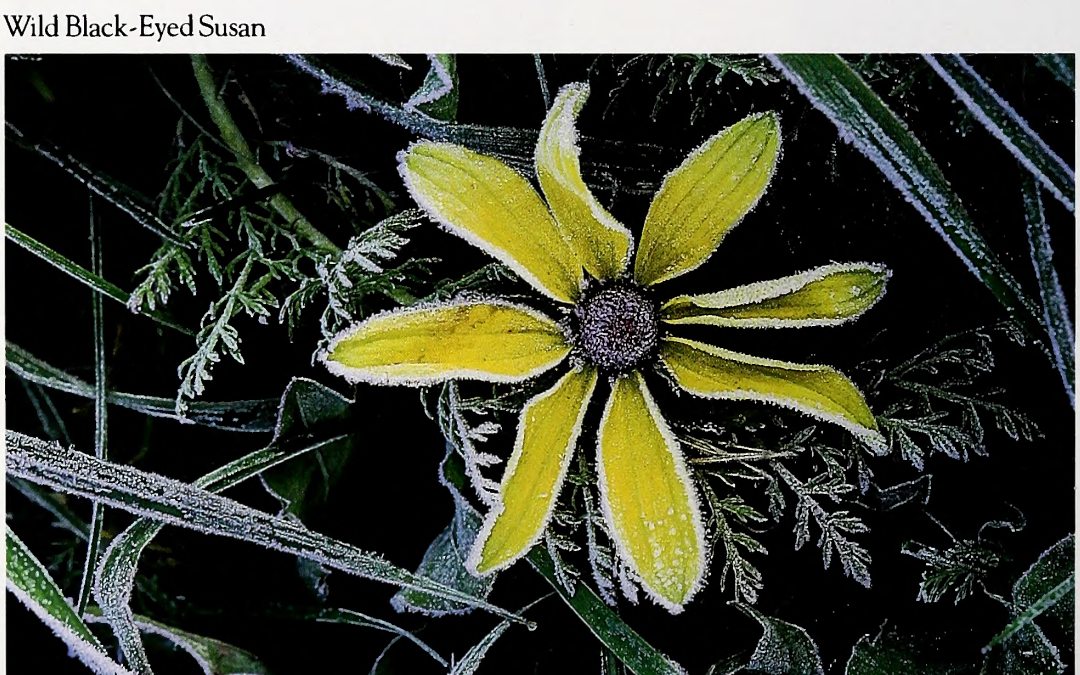
Oxeye Daisy

*It could be a summer scene,*
*though drained of its bright hues and lacking the hum*
*of bees, the clamor of birds.*
*Summer's long incandescence is a dim memory,*
*sustained only in the dulled fires*
*of a few frosted flowers underfoot.*

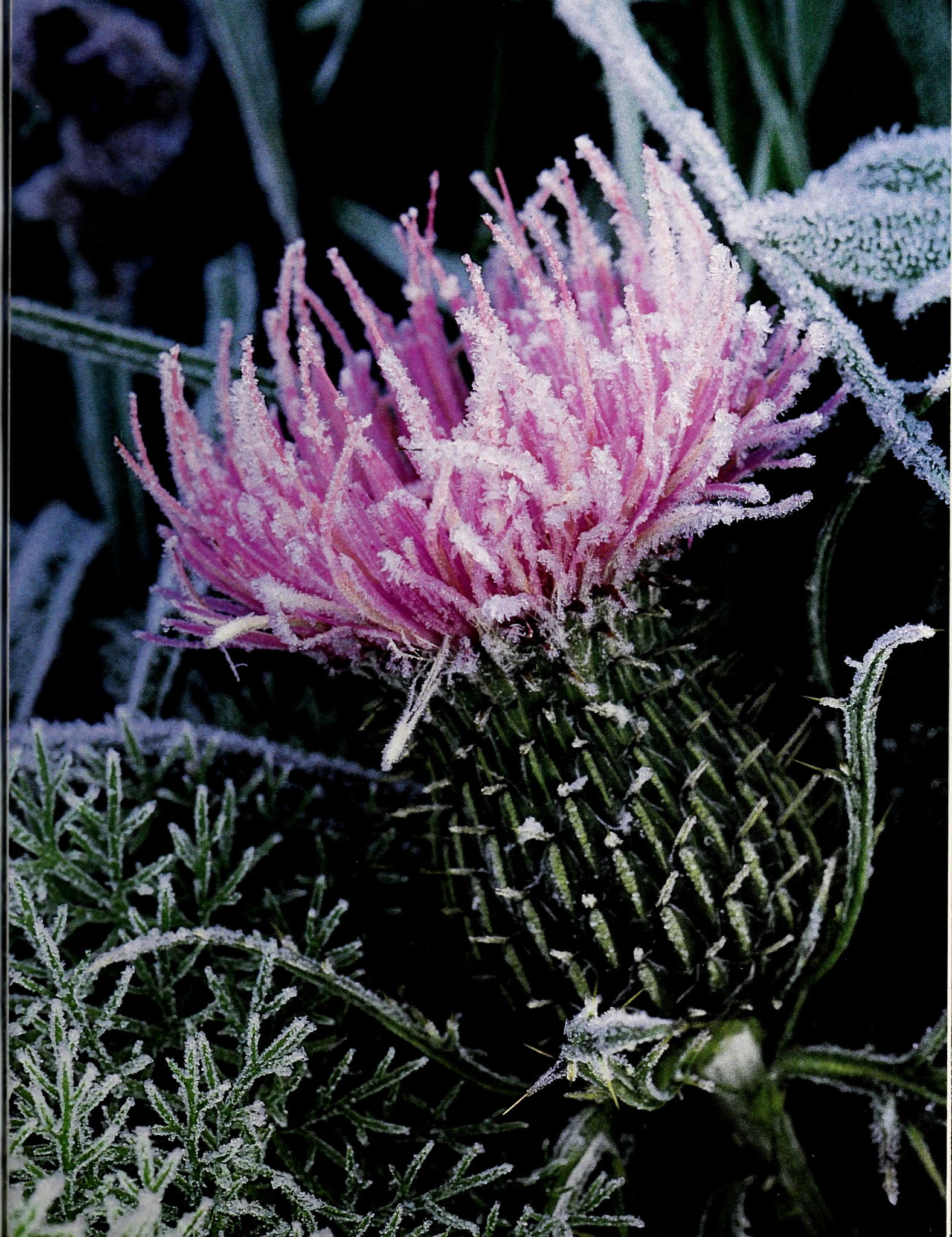


Wild Strawberry

Wild Black-Eyed Susan



Tall Thistle



# *Silence of the Winter Woods*

## What does the hunter know of winter that so many do not?

by Janet Lembke © 1992

New Year's Day. In these coastal North Carolina woods, it marks a beginning and an ending. On this its first day, the year to come still lies as tightly curled within its frosty, outermost wrappings as an emerging bud. It will swell, unfold and bloom—that much is sure, but its colors and odors, tastes and textures are still held secret. But this first day is also the final day hereabouts for one sort of human enterprise: half an hour after sunset, the gun season on white-tailed deer will close.

Except, there may not be a sunset tonight, or not one worthy of the name. It is in winter that sunsets blaze over the wide and salty Neuse River in their grandest, most spectacular fashion. December through February, no placid lavenders and pinks, no golden calms illuminate the daylight's last hour, nor does the sun slip gently down behind the far shore five miles away. Instead, it smolders and glows, bursts into violent flame that spreads like a wildfire igniting every cloud, and when it makes its sudden plunge off the edge of the world, it leaves behind a sky that is still burning, still flaring red-hot along the charred and tattered edges of the clouds. But on this chilly, gray morning of New Year's Day, the auguries for an evening filled with fire and glory do not look promising. An overcast veils the sun, and the air holds a raw, damp smell.

I'm hoping it doesn't rain before I get out of these woods. When that might be, I don't know, nor can I find out, for stillness and silence are the order of the day. I'm at the mercy of the woods and of my friend Betty, who is up a tree. Holding her .243 rifle in hands wearing insulated gloves, she's taken a perch on a tree-stand, a platform attached 10 feet off the ground to the trunk of a loblolly pine. I'm directly below, with feet on the ground, but on the lowest rung of the tree-stand ladder, back against the pine. In one respect, my position is better than hers: knee-high grass and the delicate bamboo known as Virginia cane protect me from the nippy wind that punches her with hard little gusts. But in another, I'm at a definite disadvantage: she has vistas, she can see over the vegetation that blocks my view. I can see no more than 10 feet in any direction from the end of my cold and dripping nose.

She's after deer, of course. Since mid-October, she's spent part of every weekend in the woods, under the trees or up them, but she hasn't yet bagged one buck or doe. She'd certainly like to. It's not that her family's freezer lacks fresh venison; the club to which she belongs shares the meat from each hunt among all the participating members. What she really wants is the huge, happy feeling that her patience and well-honed skills have been duly rewarded. And today's her last chance at a prize till the new season opens next October.

I don't know what I'm after. A revelation? An epiphany? Neither looks likely, not after two slow, increasingly frigid hours not moving under a tree stand. When Betty asked me to accompany her on deer season's last day, tagging along with binoculars seemed a fine idea. I'd accompanied her on other such occasions, after all, and had a good time looking, listening, being caught up in the hunt's ancient and communal rituals. And this occasion held special promise: the New Year would be greeted not with bleary midnight yawns but with wide-awake zest. I'd be turning in early to rise refreshed and eager in the crackling cold darkness just before dawn. Even better, the first day of my year would begin outdoors, with no house walls or any other barriers between me and the natural world. No barrier, that is, except for longjohns, corduroys, woolly shirt and woolly hat and all the other padding needed to keep the January cold at bay.

I'm discovering though, that this bleak reality bears little resemblance to the promise. I'm wide awake, all right, but that's about it.

Shortly after 6 a.m., when night still held its black sway and the thermometer read 40 degrees but a stiff northeast wind brought the real temperature down below freezing, Betty and her husband, Cap'n Harry, fetched me in their white, half-ton Ford pickup truck. Fifteen miles and half an hour later, when first light had bleached the blackness to a dingy gray, we arrived at the place selected by the club for its New Year's hunt—a gravel road on the edge of the Croatan National Forest. Hats and vests blazing orange in the gloom, the hunters rallied with their weapons and deer dogs and pickups. The sun came all the way up as they discussed their plans—who was to take a stand where, when the dogs would be released—but the day did not brighten appreciably. The sky remained as gray as weathered driftwood, nor did the wind abate. The talk and the planning, though, held a contagious vigor, and Betty fairly sparkled with anticipation. She'd spoken right out to choose her spot for the day—the cutdown, as she calls it, in which she'd once taken a mighty fine buck and proved to the club's male members once and for all that, yes, the lady can shoot. And after the day's plans had been laid and everyone had stood around jawing for another 15 minutes, Cap'n Harry drove us a mile and a half down the gravel road, let us off at the cutdown, and proceeded to the stand he'd chosen. So here we are, she up a tree and I down below on the cold, cold ground. And the day becomes more shivery, more gray and sullen by the moment. Could be it's fixing to rain before the day is out.

The cutdown doesn't offer a whole lot to do. Nor is it really what I'd consider a cutdown, an area thinned or denuded of trees by loggers. This place shows no sign of human management or interference. It's more a parkland, an open woods, in which this coast's ever-present loblolly pines, spaced around us in a wide, leisurely fashion, have given themselves plenty of elbowroom, and the understory is not a thicket of briers and vines but a rough carpet of dry, yellow grass with a few clumps of equally dry and yellow Virginia cane. And in this place, not even the birds have seen fit to provide entertainment. When we entered it, several brown-headed nuthatches, making a racket with their busy little squeaky-toy voices, were flitting about in the upper stories of the pines. Since then, however, I haven't seen another bird, though I've heard four more species—yelping robin, whooping towhee, caroling wren, and a couple of fussbudget chickadees. But even they have held their tongues for the last hour.

Betty sitting on her platform has a gift for maintaining silence and stillness. She does not wiggle or rustle, sniffle or cough. But 45 frigid minutes ago, she was poised for excitement. And I stopped listening for birds. The distant chorus of the deer dogs rose in pitch: they'd found a scent. The barking and baying got louder, nearer: the pack was running our way. Something started crashing vigorously through the underbrush at the edge of the open woods: oh surely, a big buck! I heard Betty release the safety on her gun. Then all the noise, the barks and crashes, ceased as abruptly as if someone had flicked a switch. Betty made a soft but definite snort of exasperation. Leaning away from the tree, I craned to look up at her. "Damn puppy," she whispered. "Got lost."

Now, the only sounds are the rattles, creaks and moans created by the northeast wind as it slams its way through grass and pines. The dogs no longer give tongue. The birds do not fly nor call nor hop about. Such inactivity means that they're resting to conserve energy, lying low to avoid exposure to the sharp wind. Or that's the explanation furnished by reason. I know that these woods cannot be so empty as they appear. But, in this near-silence, the only sign of creaturely life is my breath rolling white on the cold air. If I lived in an earlier time, I'd know that the birds had gone into hibernation.

For most of human history, till a mere 200 years ago, it was widely believed that many birds did hibernate. Though some hardier species stayed in sight year-round, others of the more tender and delicate sorts vanished in the fall and did not reappear till spring. Where did they go? It was speculated that many of the absent birds, using the bear-method, denned themselves in hollow trees or caves for the long winter's sleep. The swallows, however, were said to prefer the turtle-strategy; when autumn came, they dived into ponds and lakes, sank to the bottom, and settled themselves in the mud till returning spring bade them wake and rise into its warmth. One marveling rumor had it that some birds did indeed migrate, not hiding from

winter's rigors but making a complete escape. Their seasonal destination was not, however, some pleasantly balmy terrestrial spot; instead, they flew over an ocean of space to the gleaming and magical moon.

And in those days, though the Western world assigned great importance to the feathered tribes, they were seldom the focus of objective inquiry. Nor were they admired for their drab or glorious selves. With a few notable exceptions, Aristotle among them, people appreciated birds strictly for their usefulness to humankind. The value of any particular species might be assessed by asking one of two questions: Is it good to eat? And, what does it advise or predict for the conduct of human affairs?

Eighteenth-century lists of American birds often give answers to the first question; objective descriptions are regularly accompanied by comments on edibility. John Lawson, for example, gave a salivating yes to red-winged blackbirds, meadowlarks, and sandpipers; a disgusted no to pelicans and some, but not all, species of gulls. In the 19th century, typical of his day and age, Audubon shot, drew and devoured many of his specimens, though he never sampled cormorant flesh and vowed not to unless there were nothing better to be had. To this day, wild birds—among them, ducks and geese, swans, woodcock, snipe and doves—are brought proudly home for the supper table. And though a taste for bird-flesh may now be legitimately satisfied by licensed hunting or an easy trip to the local supermarket, some people, especially those like Cap'n Harry who were born and brought up in rural backwaters, still regard meadowlarks and robins not as birds but dinner.

As for the second question, it's flown completely out of fashion. But there were millennia in which sane, reasonable men and women were trained to interpret the songs of birds and their patterns of flight. The songs, of course, were really the voices of gods, and the birds overhead were messengers bearing directions straight from heaven.

Indeed, birds decided the outcome of the contest between Romulus and Remus to see which twin would name and rule the young city on the banks of the river Tiber. So says Ennius, Latin poet of the second century B.C., who put Rome's history into verse. As he tells it, each brother ascended one of the famous seven hills, Remus choosing an elevation to the east and Romulus, one to the west. And there, with kinsmen waiting below, each spent the night in prayer. Remus asked for a single bird, while Romulus asked for many. Then:

> In the dawn's gate, a dazzle
> an upthrusting light,
> and lured from the pierced height
> the bird prayed-for plummets,
> its winged shadow raking
> the sun's rising gold.
> And is joined, tier on tier,
> by heavenly hosts, a rapture
> of eagles, hurtling home
> to the sun's risen heart.

So it was that Romulus gained the rights and powers of kinship and its tangible earth. And the city on the Tiber was called not Remora but Roma, the name by which it is know today, some 2,500 years after the eagles made their decisive appearance.

But few people now remember those fateful birds, and certainly no one today would entrust the future course of human events to a bunch of airborne feathers, nor believe that swallows winter in the mud, nor that the white and frozen moon ....

Gunshot! Someone maybe half a mile away has fired a rifle. A deer brought down? Betty does not stir. She gives no indication whatsoever that she's ready to leave the tree stand. So we'll stay here till she lets me know it's time to walk out to the road. I push the layers of clothing back from my wrist to look at my watch—26 minutes past 10 o'clock. I haven't moved for nearly two and a half hours. The meditation on hibernation and augury, the hunt through memory for the lines from Ennius—these removed me from the cold present moment for only 12 minutes. And the temperature seems to have dropped, the sky to have darkened to a gray that definitely predicts a New Year's rain. Damn, but these woods are cold as the moon! Though I try, it's just not possible to return to a reverie that banishes discomfort and monotony by whisking me off to other places, other times, other ways of looking at the world.

But what's worth looking at here in this cutdown? Dark pine-trunk columns that hold up the heavy gray sky and keep it from crashing onto the earth. Walls of winter-killed grass surrounding the small and unkempt courtyard in which I sit. Litter everywhere around my numbing feet. Part of the litter is human trash left by Betty's unknown predecessor up in the tree stand—hardly weathered

cigarette filters and an empty pack wrapped in still-shiny cellophane. And there's woods-trash—duff, as the foresters call it—pine straw, pine cones, broken grass, dry brown leaves blown in from who knows where, deadwood riddled with insect holes, rotten sticks that bear several tiny but surprisingly colorful species of fungus. I wish I knew more about fungus. Quietly, quietly so that the hoped-for end-of-season deer that's sure to be lurking somewhere nearby won't be spooked by an untoward sound, I pick up a short, fungus-decorated stick. A dead leaf clings to it, and a piece of pine straw. *Oh!*

These pines are *not* the usual tedious loblollies that crowd trunk to trunk in the timber companies' plantations and also seed themselves everywhere with the fast-growing, me-first vigor of opportunistic weeds. Loblolly needles are short. But this straw stretches the distance from my elbow to my wrist. And look, cones measuring a full 12 inches lie on the ground not a yard from my boots. Twenty minutes to 11: it's taken me nearly three blind and shameful hours to see where I am. No cutdown, this open and park-like stand of evergreens, though fire may well have burned through within the last decade. This place in which we've spent the morning of the year's first day is a small and isolated but typical example of a longleaf pine-wiregrass savanna. Covering mile on square mile, such savannas once flourished on this sandy coast. They have immemorially furnished the habitat for several species of birds, notably Bachman's sparrow and the red-cockaded woodpecker, neither of which I have ever seen but would dearly like to. My chances may be slim because, as the stands of longleaf pines have fallen to the ax and to a commercial preference for planting trees—loblollies—that mature more quickly, the birds that require these savannas for sustenance, shelter and reproduction have been thwarted. The rusty sparrow has become rare in these parts. The lively little woodpecker, not much bigger than a downy, that excavated its nest cavity in the living wood of a fully mature longleaf pine is a species now endangered throughout its southeastern range. But the pines that surround Betty and me look young, and the several acres on which they stand would not furnish enough land to support a breeding colony of red-cockadeds.

This patch, this remnant of longleaf savanna around us seems an island amid a sea of dark green sameness, of endless loblollies, an island that even includes a few of these weed-trees, one of which I've been leaning against. But a glance shows dozens of long, long cones lying on the ground within my grass-enclosed burrow, and thousands on thousands of long, long needles on the branches overhead. And against the dark gray sky, just above the treetops, flies one of the Buteo hawks, probably a red-tail, though the light is too poor to show anything other than its broad-winged, short-tailed silhouette. If I were a Roman, I would know that its flight is one of the many voices of silence and that the bird shows itself to foretell something extraordinary. I would know that it confirms my morning-long occupation of a small yet wholly remarkable kingdom of pines.

Then, from above there falls to earth an ordinary omen, one of immediate and practical significance: a cigarette ash. Betty is smoking. It means she's called it a morning, she's no longer worried about spooking deer. It means I can stand up and stretch. It means we may break silence. I light up, too. Handing me her rifle, she climbs down stiffly from her high, wind-swept perch. After the hours of stillness, the hours of wind-buffeted quiet, we talk, and though our voices are pitched at perfectly normal levels it seems that we're shouting. She describes the crashing, baying bewilderment of the lost deer-dog puppy. I tell her about the pines, the *longleaf* pines. We both wonder who fired the single shot and if it killed a deer. The sky has become as gray-dark and oily as gunmetal, but it seems almost no time till Cap'n Harry comes along, parks the white pickup on the road beside our woods, and hollers for us to come on out of there, don't make him wait, he's pure-T ready for some food. So are we. He answers the main question about the shot as he takes me back home to the riverbank: a pitiful miss. He and Betty will return to the field after lunch; no sense letting the last day of deer season get clean away. It will get away, though, for the rain that's threatened all morning will come down drenching and icy cold, driving most of the hunters back to their firesides and their hot-blooded, 10-point dreams.

"Happy New Year," Betty says in her calm, low voice when we reach the river. As I climb the steps to the front porch, Cap'n Harry roars out, "Happy New Year!"

Thank you. Yes. ☒

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*Janet Lembke is a writer from Havelock, N.C. "Silence of the Winter Woods" is from her latest book,* Dangerous Birds, *published by Lyons and Burford (1992).*

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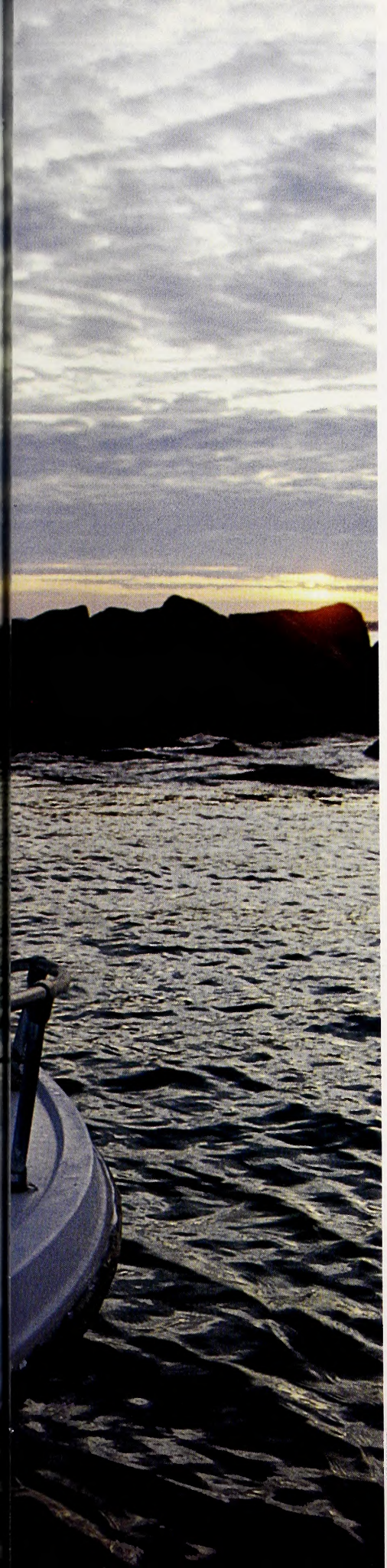


JOE NESBITT

***Fall is widely considered** the best time to fish along the North Carolina coast, but spotted sea trout keep biting through the winter months, especially when the weather remains mild.*

# *Chill Out for* SEA TROUT

## Are you tough enough for this fish? Be forewarned—catching the spotted sea trout takes skill, luck and a tolerance for the elements.

by Gerald Cooney © 1992

It is 6 o'clock in the morning, the fifth day of a new year and my first opportunity to do some winter fishing for speckled trout. The temperature gauge outside my door reads 45 F and the wind is blowing out of the northwest at 5 miles per hour—perfect conditions for the type of drift fishing I intend to do at the end of Masonboro Inlet today. I don several layers of clothes, grab my sweater, my orange hat, hot coffee and head for the car.

Even now, after more than 20 years of fishing for specks, I've had trouble sleeping the night before the trip. While a few fishing writers have belittled the speckled trout, calling it a "poor fighter," to me it epitomizes all one could hope for in a game fish—beauty, spunk and excellence on the table.

I hope one of my fishing guests for the day, Jim Busbin, will agree. Busbin, a faculty member at Western Carolina University and one of my summer season fishing partners, is an excellent king mackerel angler. But he's never been on the reel end of a mid-winter speck.

Busbin meets me at the marina. My 20-foot Mako, a shallow-draft center console, is tied up at the loading dock and is ready to go. There's not a lot of equipment needed for winter speckled trout fishing—a couple of light-action spinning outfits spooled with 6-pound test leader and a number 4 treble hook.

Busbin is raring to go. "Before we fish," I tell him as we pull out of the boat slip, "we're going to have to find some bait." While artificial lures will occasionally work on winter trout, live bait is a far better choice. And live shrimp, when you can find them, are the best choice.

I use an 8-foot cast net when trying to catch a mess of shrimp; it's large enough to get a good spread when casting and small in mesh size, ⅜ inch, thus keeping the bait contained.

Usually it's not necessary to go farther than the marina to find bait; the trick is to make sure that a good cast is made when hunting for shrimp. They get a little spooky this time of year, and a bad cast will scatter the shrimp and make them a little more difficult to come by.

State law allows 100 shrimp in possession per angler for recreational fishing. If shrimp can't be found, another bait to use is small spot, also found around the marina area. While shrimp and spot are the premier baits during the January run of speckled trout, finger mullet and small croaker should not be discounted. And mud minnows, easily available in the back-creek areas, are another excellent backup bait.

After boating enough shrimp near the marina, we head to pick up Bob Rainey, a full-time fishing partner of mine. He greets us at the Wrightsville Beach boat ramp with a couple of bait buckets full of mud minnows, caught in a slough close to the ramp with a minnow trap.

"Hi, guys," Rainey waves as he climbs on board with his cargo. "Looks like we got enough minnows for a couple days of fishing." With everyone aboard, we motor back up the Intercoastal Waterway for several minutes and cut left into Masonboro Inlet, which is located at the south end of Wrightsville Beach. The inlet is guarded on both sides by two rock jetties that reach several hundred yards out into the Atlantic. The north jetty was built in the 1960s, while the newer south

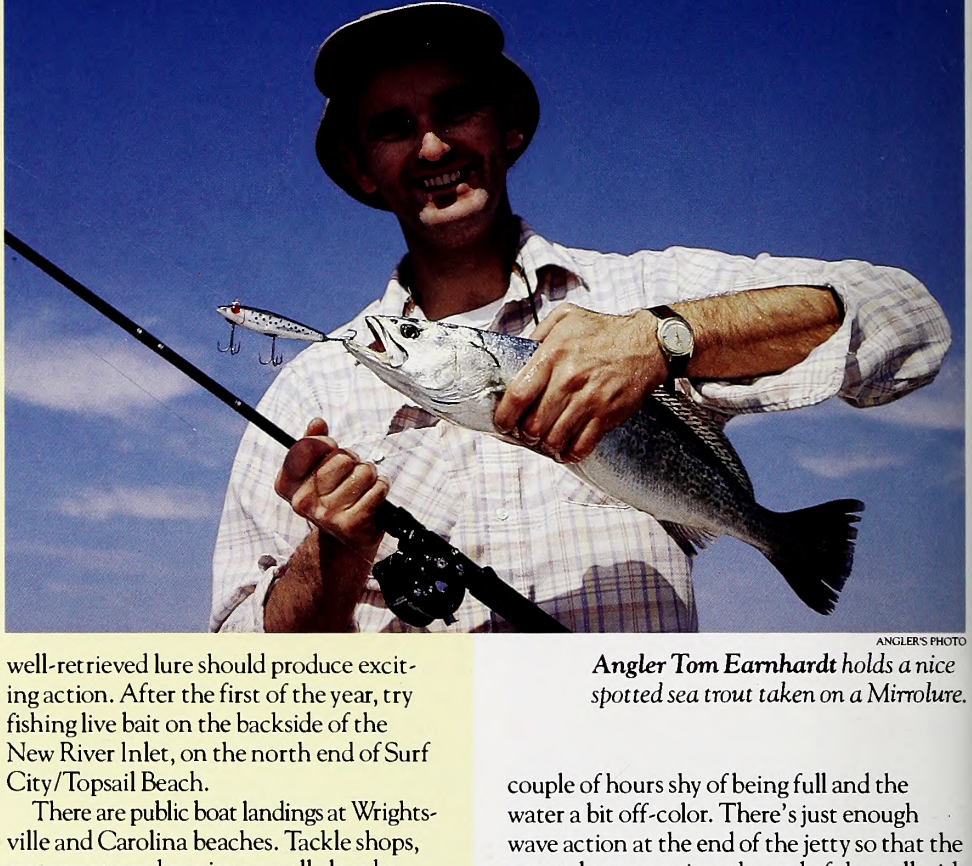
# Southeastern Speckles

The speckled trout, referred to by the International Game Fish Association as spotted sea trout, *Cynoscion nebulosus*, has returned to our coast in greater numbers than in several years. There have been plenty of small "puppy trout" in evidence, a sure sign that the fishery is in good health. And that may be, in part, to the 3-year-old regulation that prohibits the harvest of specks smaller than 12 inches total length.

The speckled trout season in southeastern North Carolina kicks in as early as September when schoolies can be found running the waters between Snow's Cut (which connects the Cape Fear River and the ocean) and Carolina Beach Inlet. A month or so later, the fish stack up at Mason Inlet, on the north end of Wrightsville Beach. This is an excellent spot for surf-casters who would like to tangle with specks that will average out at a couple of pounds apiece.

Topsail Beach is another surfcaster's paradise with speckled trout holding close to the area's fishing piers and in the sound on the south end of the beach. Live bait and artificials (Mirrolures and jigs) work well both on the beach and in the back waters. From Thanksgiving to Christmas, trout run the beaches in fairly good numbers, and a well-retrieved lure should produce exciting action. After the first of the year, try fishing live bait on the backside of the New River Inlet, on the north end of Surf City/Topsail Beach.

There are public boat landings at Wrightsville and Carolina beaches. Tackle shops, restaurants and marinas are all close by.



ANGLER'S PHOTO

***Angler Tom Earnhardt** holds a nice spotted sea trout taken on a Mirrolure.*

jetty was finished in the late 1970s.

The wind is still blowing northeast and, on an outgoing tide, the water in the inlet is slick. That means that we'll get a good drift on our bait along the rocks.

I wind down the motor as we approach the end of the south jetty, a peninsula of auto-sized boulders. Because of the current flow in the inlet and a falling tide, we anchor the boat facing back to land so that the moving water keeps the boat parallel to the rocks.

"Well, so far, so good," I tell my friends. "The wind's out of the northwest, the current is flowing just right and the water is a little cloudy."

Like the many speckled trout anglers that seem to disappear around Thanksgiving when hunting season gets underway, the smaller school trout in the 1- to 2-pound range also take a leave of absence. What's left when January rolls around are fat and sassy trout that sometimes average out at 5 pounds apiece or more. And, because of the scarcity of bait in the intertidal zone, these fish are willing to suck in just about anything offered. That is, of course, if the bait is alive and kicking.

Early in the fall, I stick mostly to a jig and grubs when working the rocks for speckled trout. At that time, the jig is hard to beat and very seldom attracts pinfish or other piscatorial pests. But, in the middle of winter, the bigger speckled trout seem to be in the mood only for live bait.

As important as live bait is for success, the tides, or more specifically, the times of the tides, are even more critical.

What's the best tide to fish for winter trout? I've found that it doesn't make much difference what tide is fished, so long as you're fishing the end and the turn of the tides. Most of the time, winter specks will only come out to play on the last couple of hours of a tide and on the turn. In fact, I like to fish one tide, go to breakfast, and come back to my fishing spot at the end of the next tide.

Another consideration when angling for winter trout is water clarity. Slightly cloudy water seems best, but there's a thin line between cloudy and murky. A good measure in deciding whether or not the water color is on the money, aside from catching fish, is the disappearance factor. If the bait you are using is visible down to 3 or 4 feet before it disappears, then you've got about the right clarity for good fishing. If the bait disappears almost immediately, chances are fishing will be slow.

Really clear water also seems to pose a problem for the trout angler, though it doesn't seem as critical as water that's too cloudy. While clear water on a calm day almost always signals slow fishing, a little chop on the water will usually serve to neutralize any negative aspects of the clear water.

Fortunately for us today, the tide is a couple of hours shy of being full and the water a bit off-color. There's just enough wave action at the end of the jetty so that the water slaps up against the end of the wall with just enough force to cause a spray to splash back on the surface. I couldn't have asked for better conditions for a first-time trout outing for my friend.

"Rather than anchor up, I'm going to keep the motor running and let you cast into the rocks," I tell Busbin as I position the boat within casting distance of the jetty. "The noise of the engine doesn't seem to bother the fish."

As I keep the boat positioned, Busbin baits up with a live shrimp and flips the offering out toward the point of the jetty. The bait and the cork land together with a splat. I watch as the shrimp disappears into the depths.

The float is pre-set so that it will keep the bait about 8 feet down and 3 feet off the rocky bottom, a depth that produces trout at the time of the tide that we are fishing.

I usually use a piece of rubber band or dental floss as my line stopper. Either one slides easily on the line and neither gets caught on the guides when casting. Once in place, I will spray the knot with florescent paint to keep track of it both in the boat and in the water.

My float size on any given day is determined by the current flow and sea conditions. When there is a fast current and choppy seas, I use a larger float to keep the drift slowed down. When the water is calm and current slow, I'll put the smallest float I can find.

A bead on either side of the float keeps

the slip-knot and float separated and also adds a little attraction. A slip-sinker matched to the day's conditions is placed just above the barrel swivel connecting the line and leader, completing the rig.

Busbin's float bobs in the backwash close to the jetty. It won't be long before the current catches a bit of the line and pulls the float and bait out into the swifter water. It is at that moment that I usually expect a cruising trout to hit the bait and yank the float under.

"Pop the cork, Buss," I yell. "See if you can get those specks interested."

Busbin, who's in the bow, gives the rod a little twitch and the float dips under the water. This kind of action often attracts suspended trout to the surface to see what all the commotion is about.

As expected, the float breaks away from the backwash and eases out into the current, which is running back down the jetty. The float takes a little turn to the left, then disappears.

"Reel in the line," I tell Busbin, "and keep your rod butt right where your belt buckle is and point the tip toward where you think the float is. When the line is tight, set up quick and easy and you should have her hooked up."

I always get nervous when a speckled trout is on and it's no different this time. In fact, maybe a little more so because my friend has never been trout fishing before and these specks are running a whole lot bigger, and smarter, than what a neophyte would normally run into.

"It's on," shouts Busbin, "and it feels like a pretty good fish."

"Just stay calm, stay calm," I caution Busbin, who doesn't show any signs of being nervous at all. Actually, I'm the one about to lose it. I visualize a 5-pound speck pulling against the 6-pound test line on a course to the rocks, intent on spoiling Busbin's first encounter.

"Keep your rod tip up and let the drag do the work," I advise, watching the line scoot through the water toward the rocks.

Usually you don't have to worry about early-season trout getting into the rocks; those fish are just schoolies and will average out at 1½ to 2 pounds. But with the speckled trout we run into after the Christmas holidays, broken lines and lost fish are commonplace.

Just when I'm sure this trout is going to pull an escape trick, it breaks to the surface and splashes, showing its muscle. The display on top takes a good bit of energy out of the trout and Busbin plays the fish perfectly from the rocks back to the boat. As it comes alongside, I know it will go 7 pounds or more. And it is then that the fish decides to head for freedom via the underside of my Mako.

JOE NESBITT

***Drifting live bait** along the jetties is one of the most effective methods for catching winter sea trout on the southeastern North Carolina coast. Artificial lures are more effective earlier in the fall.*

Fortunately, Busbin's skill as a king mackerel angler comes into play and he thrusts his rod down into the water, keeping the line from rubbing against the bottom of the boat.

The line holds and my buddy urges the fish back up to the side of the boat while Rainey places the net into the water and waits as the trout heads into it. With a quick swoop, net and fish are up, over, and into the boat.

"All right!" Busbin yells and smiles and high fives are exchanged between the three of us.

"It's a real trophy," I say to Busbin, as he untangles the speckled trout from the net. "There are a whole lot of speckled trout fishermen that go through a lifetime of fishing without ever catching a fish this big, and you do it on the first try."

Busbin is happy with his catch but I'm not sure he fully appreciates the significance of the catch. In the 18 years that I have seriously fished for speckled trout, there have been only four times when I've put a 7-pound or better fish in the boat.

"Go back home," I kid, "and hang a poster-size picture of your trout on the wall and don't ever fish for trout again. You'll miss the days of fishing in the middle of winter with no luck. Besides, with that picture on the wall, everyone will think you're a pro."

Busbin answers by putting another live shrimp on his hook and casting toward the rocks, ready to do battle with yet another heavyweight of cold water. ☐

*Large-scale Habitat Improvements Needed*

# Wildlife Commission Begins New Small Game Strategy

*Written and Edited by Vic Venters*

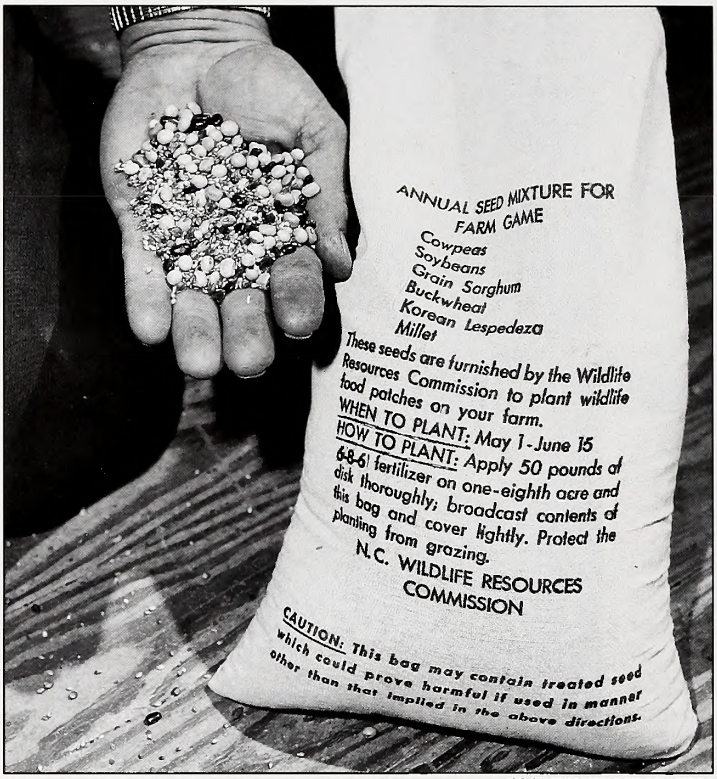
To encourage landowners to improve small game and farm wildlife populations, the N.C. Wildlife Resources Commission will be embarking on a new direction in its small-game management program.

Emphasis will shift from the distribution of free seeds for annual food plots to a program designed to teach landowners how to incorporate more comprehensive small-game management practices with existing land uses.

A series of 18 workshops will be held this spring across the state to assist landowners, land managers and sportsmen in developing their lands for maximum enhancement of small game wildlife populations. The schedule for the workshops will be announced in January.

Points that will be emphasized in the new program are encouraging the planting of warm season grasses; printing and distribution of pesticide fact sheets; encouraging the Forest Stewardship Program; and management of powerline right-of-ways and road shoulders for wildlife habitat.

"The free distribution of annual seeds was a good program in that it originally gave Commission biologists the chance to visit with landowners to advise them on proper management for small game," said Terry Sharpe, the Wildlife Commission's small-game project leader. "That has changed as many farms are owned by citizens who live and work off the farms. Additionally, reasonably priced annual seeds for annual plantings are available through local food and garden stores."




N.C. WILDLIFE RESOURCES COMMISSION

***Beginning this spring,*** *the Wildlife Commission will be placing renewed emphasis on proper habitat management for small game. Free handouts of annual food plot seed mixtures will be replaced by a series of 18 habitat improvement seminars.*

In recent years, biologists have also discovered that food plots, if not located in adequate cover, can actually do more harm than good to quail populations by concentrating the birds for increased winter mortality through predation or excessive hunting pressure.

Under the new direction, landowners will be encouraged to plant more native warm-season grasses. These grasses not only yield high-quality forage and hay for cattle, but also provide excellent cover for quail and rabbits. "By converting a portion of fescue pastures to native warm-season grasses, we can potentially increase profits on 1 million plus acres of pasture and haylands while also improving the small-game habitats," Sharpe explained. "By encouraging a more selective use of pesticides, we can have a positive impact on wildlife on more than 4 million acres of row crops across the state."

An additional 12 million acres of privately owned woodlands could be managed for wildlife under the Forest Stewardship Program, a federally funded program that puts wildlife habitat management on an equal basis with timber production.

In early spring, look for a full-length article in *Wildlife in North Carolina* that will highlight in greater detail the new small-game management program.

*—Bodie McDowell and Vic Venters*

*Volunteers Time for Wildlife Commission*

# Judge To Head National Park Board

Judge Robert F. Orr of the N.C. Court of Appeals has been elected chairman of the National Park System Advisory Board. The 16-member board is appointed by the U.S. Secretary of the Interior and advises the Secretary on matters pertaining to the National Park System and the designation of National Historic Landmarks.

Orr is also a well-known conservationist and is active in Trout Unlimited and other conservation organizations in the state. He has also been a long-time supporter of the N.C. Wildlife Resources Commission's Enforcement Division, and he volunteers his time to swear in new Wildlife Commission enforcement officers.

Orr practiced law in Asheville for 11 years before being appointed to the Court of Appeals in 1986 and elected to the Court in 1988. He was appointed to the National Park System Advisory Board in 1990 by Secretary of the Interior Manuel Lujan Jr.

***Judge Robert F. Orr*** *has been elected chairman of the National Park System Advisory Board.*

*Survey Shows Big Decline*

## Weather Hurts Woodcock Population This Year

There will be fewer woodcock visiting North Carolina this year, according to data published this fall by the U.S. Fish and Wildlife Service.

As measured by the Service's annual 1992 spring singing-ground survey—which counts the number of courting male woodcock during breeding season—populations crashed 16.6 percent on both the Central and Eastern flyways.

"The 1992 report is not filled with good news," writes Greg Sepik, the U.S. Fish and Wildlife Service's woodcock specialist for the Northeast region. "The number of males heard per survey route in both flyways was the lowest ever recorded since the survey was started in 1968."

If these estimates are accurate, it's certainly more trouble for a bird that has been declining in its Eastern Flyway—which includes the Northeast, the Mid-Atlantic and the Southeastern states—for at least 20 years. Before this latest decline, woodcock populations in the Eastern Flyway had dropped almost 40 percent since 1969. Most woodcock in the eastern flyway breed in the Northeast and migrate south in the winter, and North Carolina is thought to be a major wintering ground for many of these birds. "From what I've seen up here (in Maine) this fall," Sepik said, "the birds are scarce."

Although habitat loss and alteration on its breeding grounds have been blamed for many of the woodcock's problems, "the direct cause of this latest decline is probably the weather," writes Sepik. "The drought during the summer and fall in the East was severe in many states. During drought, earthworms are scarce and some woodcock will starve."

"A lack of snow cover in many Northern states and cold weather in during spring migration also contributed to the declines," Sepik elaborated. "Without snow, frost will penetrate deep into the soil and earthworms are harder to obtain. Birds can survive cold temperatures by increasing their food intake. However, the combination of below normal temperatures, which means the birds must eat more worms to survive, and frozen ground, which resulted in fewer worms, undoubtedly led to the death of some timberdoodles."

"Another result of these weather extremes was delayed nesting," Sepik writes. "In this part of the world (nesting) was delayed about one month—enough to delay or prohibit renesting. Because about 50 percent renesting is not uncommon, the inability to renest can affect the population significantly. I suspect nesting was deferred through much of the breeding grounds; yet another reason why flushes will be scarce this fall."

In the 1990, the U.S. Fish and Wildlife Service announced its latest American Woodcock Management Plan to help restore populations of this unique game-bird. For more information on the plan, direct questions or comments to Ashley Straw—Woodcock Specialist, Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, Maryland, 20708-9989.

LEONARD LEE RUE

***Poor weather conditions** this spring on breeding grounds are being blamed for a substantial decline in this migratory bird's population. North Carolina is believed to be a major wintering ground for woodcock.*

## Old Striper Caught in Kerr

A North Carolina angler landed a 23-pound striped bass this spring near the Clarksville Bridge across the Virginia border at Kerr Reservoir this spring. Although impressive, the historical significance of this fish far outweighed its size. The angler, Neal Loman of Greensboro, found a tag on the fish that indicated the male had been tagged on a spawning run in April 1979.

According to Bill Kittrell, a fisheries biologist with the Virginia Department of Game and Inland Fisheries, this striper was probably 7 years old when tagged. This means the fish was at least 20 years old, having been caught 13 years after originally being tagged.

"Male stripers grow much slower than females, especially as they age," said Tony Mullis, the N.C. Wildlife Commission's striped bass biologist. "A 23-pound male is a real monster."

The Virginia Department of Game and Inland Fisheries tagged 7,419 striped bass in the Dan and Roanoke rivers from 1976 to 1979 as part of a five-year study of the fishery.

"Although only a few tagged fish still remain," Kittrell said, "anglers in North Carolina and Virginia are encouraged to check their catch for tags, just in case they've caught a little piece of history." Anglers who may catch tagged stripers on either the North Carolina or Virginia side of Kerr Reservoir can contact Kittrell at (804) 392-9645.

*Information courtesy of the Virginia Game and Inland Fish Department*

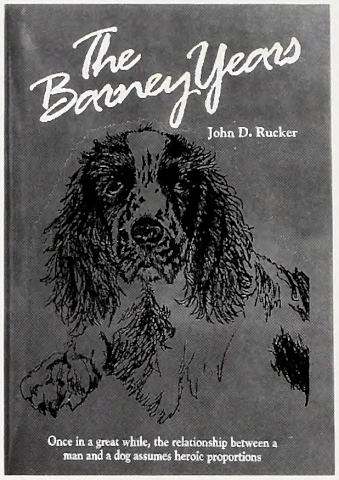
*Book Review*

## New One From John Rucker: The Barney Years

The Barney Years *by John D. Rucker. Published by North Word Press Inc., Box 1360, Minocqua, WI 54548. Hardcover, illustrations, 140 pages, 1992, $16.95.*

Readers of this magazine will no doubt remember the highly popular article "The Barney Years" (February 1991) that chronicled author John Rucker's life with his fish-retrieving springer spaniel Barney. It's fair to say that the magazine received more glowing letters and comments on this article than anything else we've ever published.

This book of the same title is an elaboration of that true tale—an autobiographical story of the pair's lives, travels and travails across the Great Plains, Alaska and their home state of North Carolina during the 14 years of Barney's life. It's also a more detailed narrative follow-up to *Melancholy Bay*, Rucker's wonderful first book written in journal form.




*The Barney Years* begins with Rucker leaving North Carolina after college graduation knowing only, in his words, "that I would choose from among Montana, Idaho, and Wyoming to find my fair share of life's bounty. There was no friend, no family, no eccentric uncle. There was much to be learned."

With Barney as his partner, Rucker lives and works across Montana and Alaska alternatively as a ranch hand, prize fighter, English teacher, drama coach and commercial fisherman. Rucker is also a bird hunter, trout fisherman and naturalist, and a lover and keen observer of the wilderness. Together the pair survive near-drownings, storms at sea and a host of other life-and-death adventures.

What distinguishes this book is Rucker's uncanny ability to convey to the reader his love for Barney (and nature), without resorting to the cloying sentimentality so common in most "me-and-my-dog" stories. Rucker also calls his book a plea for living simply and for an environmental ethic, and he backs up his sentiments from a perspective of someone who's had the courage to follow his dreams.

In short, the book is entertaining and enlightening and should appeal to a wide spectrum of readers. Read it—laugh, learn and cry. *The Barney Years* is available in bookstores, or signed, inscribed copies can be obtained for $18 postpaid by writing John Rucker, P.O. Box 9432, Greensboro, N.C. 27429.

*In Education Category*

## Commission Publication Wins Award

The N.C. Wildlife Resources Commission's Division of Conservation Education took home an award this summer for *North Carolina WILD Notebook*, an educational publication designed for teachers and students grades K through 12.

*North Carolina WILD Notebook* placed second in the education category at the annual convention for the Association of Conservation Education. ACI is an international association of state and federal conservation agencies. This is the fourth consecutive year that *North Carolina WILD Notebook* has won either first or second place in the education category at ACI.

The notebook is the official publication serving North Carolina WILD, the environmental-education program of the Wildlife Commission. This program includes Project WILD as a chief component. Project WILD is a national award-winning environmental-education program consisting of instructional workshops and supplementary curriculum materials for teachers of kindergarten through high-school age students. The goal of Project WILD is to raise students' awareness of conservation issues and to prepare them to make responsible decisions. The program emphasizes wildlife and the conservation of natural resources and is sponsored principally by state wildlife agencies and state departments of education.

## Field Notes

| | |
|---|---|
| Eastern Gun Deer | Through Jan. 1 |
| Central Gun Deer | Through Jan. 1 |
| Northwestern Gun Deer | Through Dec. 12 |
| Western Gun Deer | Through Dec. 12 |
| Black Bear | See *Regulations Digest* |
| Wild Boar (second season) | Dec. 14-Jan. 1 |
| Gray Squirrel | Through Jan. 30 |
| Fox Squirrel | See *Regulations Digest* |
| Rabbit | Through Feb. 27 |
| Raccoon and Opossum | See *Regulations Digest* |
| Brant | Dec. 5-Jan. 20 |
| Bobwhite Quail | Through Feb. 27 |
| Ruffed Grouse | Through Feb. 27 |
| Snipe | Through Feb. 27 |
| Woodcock | Dec. 10-Jan. 23 |
| Mourning Doves | Dec. 12-Jan. 15 |
| Crow | See *Regulations Digest* |
| Ducks, Mergansers and Coots | Dec. 28-Jan. 20 |
| Sea Ducks | Through Jan. 20 |
| Snow and Blue Geese | Through Feb. 10 |
| Swan (by permit only) | Through Jan. 30 |
| Canada Geese | Closed |

Information on bag limits, either-sex hunts, permits and other regulations may be found in the *1992-93 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest*. For a copy, check with license agents or contact the N.C. Wildlife Resources Commission.

## Wildlife Endowment Fund Report

**September 1992**

Principal Balance
$17,446,795.30
Interest Earned
$10,194,533.94
Total Receipts
$27,641,329.24
Interest Used
$4,123,817.48
Fund Balance
$23,517,511.76

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to *Wildlife in North Carolina* magazine as well as from tax deductible contributions. While the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.

## Calendar

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before traveling to an event. Listings should be conservation oriented.

**Dec. 5-6**

The fifth annual Core Sound Decoy Festival at the Harkers Island Elementary School will feature old and new decoy exhibits, carving demonstrations and competitions, educational exhibits and retriever demonstrations. Also featured will be an auction on Saturday for antiques and modern collectible decoys. Proceeds will benefit the proposed Core Sound Waterfowl Museum. For more information, contact the Core Sound Decoy Carvers Guild, P.O. Box 308, Harkers Island, N.C. 28531, or call (919) 728-4644.

## Wild Turkey Harvest Up

Tar Heel turkey hunters took a record harvest of gobblers for the ninth straight year this spring. In the April-May season, 2,215 birds were legally killed and reported, a 21 percent increase over the 1991 harvest of 1,818 birds.

The increases are proof positive that the N.C. Wildlife Resources Commission's turkey restoration program is still working. Wild turkeys are live trapped in the state and moved to restoration areas where the hunting season is closed until populations grow to sustainable levels. Additional turkeys are obtained from other states in cooperation with the National Wild Turkey Federation's Superfund program. North Carolina's wild turkey population is now estimated to be about 30,000. That compares to a population of 2,000 in 1970.

## The 1993 North Carolina Wildlife Calendar Is Here!

***With such artwork** as Robert Flowers' "A Distant Clamor" featured above, the North Carolina Wildlife Calendar is sure to sell out again this year.*

The works of Robert C. Flowers, Jr., Brooks Pearce, David E. Doss, Robert B. Dance, Bob Herr, Duane Raver, Mel Steele, James A. Brooks, Joe Seme, and Dempsey Essick are featured in the 1993 Wildlife Calendar. Order yours today by returning the form below with your check or money order to 1993 Calendar, N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, N.C. 27604-1188.

### ORDER TODAY!

Please send me ..... N.C. Wildlife Calendars at $6.00 each $_____
All N.C. residents add $.36 sales tax per calendar _____
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Enclosed is my check for ..... Total $_____

**If ordering 7 or more calendars, please provide your UPS deliverable address.**

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Address _____ Apt. # _____
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Office located at: 322 Chapanoke Rd., Raleigh N.C. 27603

All orders must be prepaid. We do not bill. A $20.00 charge will be made on returned checks (N.C.G.S. 25-3-512).

**For fund raising and bulk rate information (10 calendars or more), call 919-662-4377. Please allow 6 weeks for delivery.**

CALO93

# Goof-up With Glycerine

*by Vic Venters*

During times of freezing weather, songbirds need a source of water for both drinking and preening purposes, and a backyard birdbath is an excellent supplement to your feeders. Recently, some articles in magazines and newspapers around the country have recommended using glycerine, an alcohol-like chemical, as an anti-freeze to keep water open in birdbaths during winter. Ornithologists at the Cornell Laboratory of Ornithology, however, warn against using glycerine for two reasons:

First, large concentrations of glycerine—up to 30 percent—must be used to prevent water in a bath from freezing. Birds drinking concentrations of the water/glycerine mixture at that level will experience elevated sugar levels, causing hyperglycemia and, possibly, death.

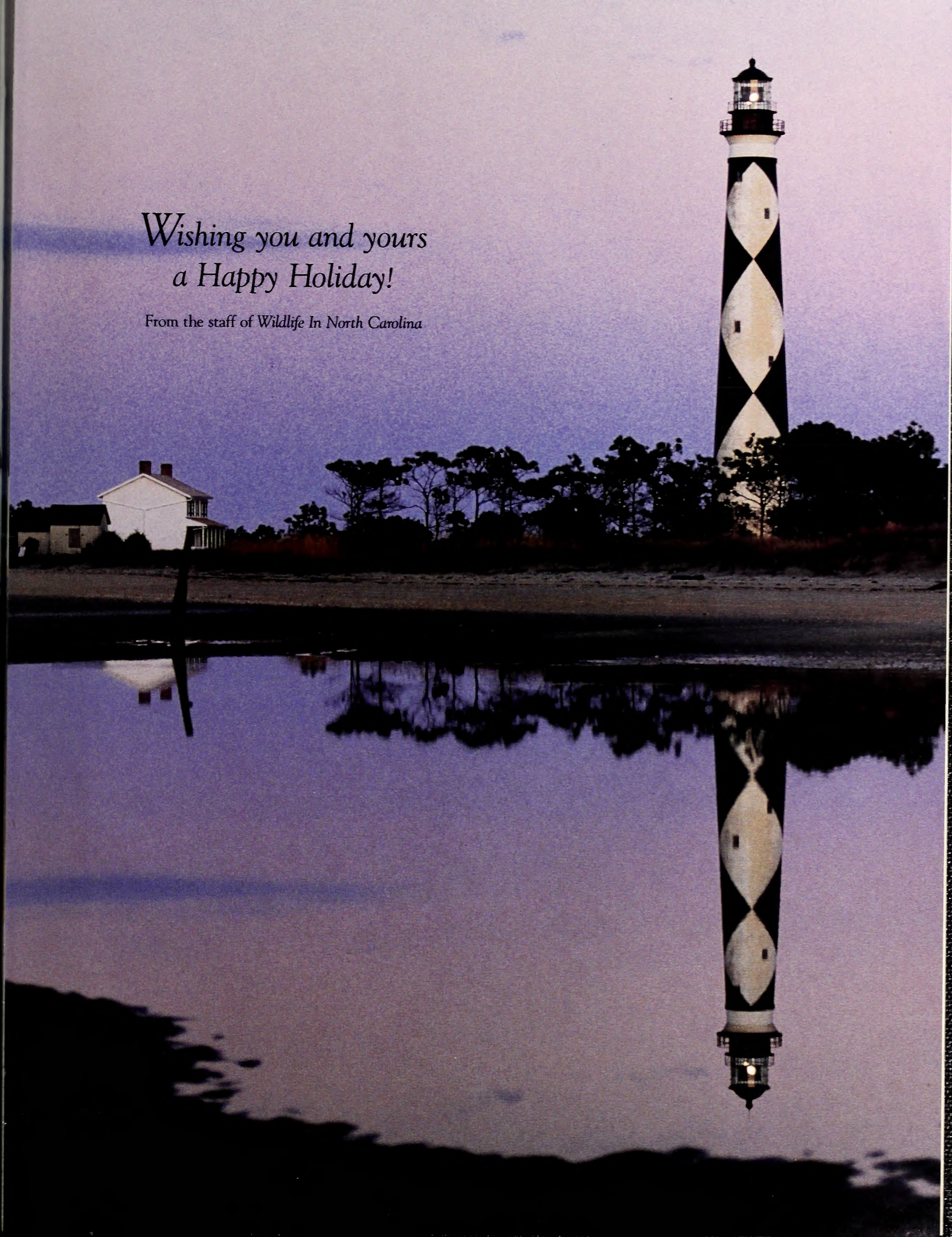
Many birds also preen themselves in cold weather to enhance the insulation value of their feathers. Birds preening in a glycerine/water solution can end up with matted feathers. When matted, feathers are poor insulators and many birds may freeze to death in cold weather.

In very cold climates, ornithologists recommend placing electric immersion-style heaters in the birdbath to keep water unfrozen. In the milder climes of Piedmont and eastern North Carolina, the weather is rarely frigid for long enough to require water heaters. Instead, you can pour a kettle of hot water in the frozen bath each morning, or as often as required on very cold days. Remember to keep your water fresh in the bath and remove leaves and other debris regularly.

During warm spells clean your birdbath periodically using a mild solution of water and liquid chlorine laundry bleach—about one teaspoon chlorine to a couple of gallons water. This will kill bacteria and algal growth. Be sure to scrub and rinse very thoroughly before adding fresh water.

For more information on providing a watering hole for backyard birds, send a self-addressed stamped envelope to the Cornell Laboratory of Ornithology, EIS Dept. N-4, 159 Sapsucker Woods Road, Ithaca, N. Y. 14850.

*Some information courtesy of Cornell Lab of Ornithology*


*Wishing you and yours*
*a Happy Holiday!*
From the staff of *Wildlife In North Carolina*

## Couch Potato Duck

This drake mallard is clearly taking it easy. Mallards are among the most common ducks found in beaver ponds and flooded river bottoms in the Coastal Plain.

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